INTRODUCTION

This Service Manual describes the basic information required when servicing BJ-W7000 Printer in order to maintain quality and performance at an optimum.

This manual is divided into the following six sections.

Chapter 1 General Introduction	: Describes the feature, specifications, operation method and handling precautions of the BJ-W7000 Printer.
Chapter 2 Operation	: Describes the operating principles of the mechanical and electrical systems by function.
Chapter 3 Mechanical System	: Describes how to disassemble and assemble the mechanical system
Chapter 4 Maintenance and Inspection	: Lists the periodic replacement parts table, target wear table for consumables and the periodic servicing table.
Chapter 5 Troubleshooting	: Describes maintenance and inspection, standards, adjustment, how to remedy faulty image reproduction and how to remedy faulty operation.
Appendix	: Circuit diagram, PCB wiring diagrams, etc.

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.
   In the diagrams, ▬▬▬ represents the mechanical drive path, ⟶ indicates the direction of the electric signal.
2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High," while '0' is used to indicate "Low." (The voltage value, however, differs from circuit to circuit.)
3. In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operation of the microprocessors used in the machines are not discussed.

The descriptions in this Service Manual are subject to change without notice for product improvement or other reasons, and major changes will be communicated in the form of Service Information.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information and be able to identify and isolate faults in the machine.

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I. SPECIFICATIONS

Name	Bubble-Jet Printer BJ-W7000		
Type	Stand stacker type		
Print Technology	Bubble-Jet		
Head Configuration	1 × 128 nozzles × 4 colors		
Head Drive Frequency	10 kHz, 8 kHz, 6.75 kHz		
Print Mode	DRAFT Mode NORMAL Mode ENHANCED Mode		
Color Mode/ Monochrome Mode	Provided		
Print Speed	Refer to Table 1-101.		
Resolution	360 dpi × 360 dpi		
Interface	Parallel port (Conforming to IEEE 1284-B)		
Data Format	SRL (SELEX RASTER LANGUAGE)		
Internal Memory	8 MBytes		
Expansion Memory	Not provided		
Margin	Refer to Table 1-102.		
Media Type	Cut sheet, Roll		
Media Material	*1 Plain Paper, Glossy Paper, Semi-Glossy Paper, Heavyweight Coated Paper, Glossy Film, Back Print Film		
Media Width	210 mm – 914 mm/ 8.5" – 36"		
Max. Media Length (Cut Sheet Media)	1250 mm		
Media Size	Cut Sheet	ISO	*2 A0, A1, A2, A3, A4
		ISO Over	*2 A0, *2 A1, A2, A3
		JIS	*2 B1, B2, B3, B4
		ANSI	*2 34" × 44", 22" × 34", 17" × 22", 11" × 17", 8.5" × 11"
		ARCH	*2 36" × 48", 36" × 24", 18" × 24", 12" × 18", 9" × 12", *2 30" × 42"
	Roll	A0, A1, 36", 24" (outer diameter: 100 mm/ 4" or less, inner diameter: 51 mm/ 2")	
Auto Cutter	Provided (Y-axis)		
Media Discharge	Face up		

*1:Plain Paper can be used. However,printing quality cannot be assured.
*2:These paper sizes can be handled only when fed vertically.

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Media Stacking Capacity	Max. 25 Sheets (Roll,A0 or less), Max.1sheet (Cut Sheet)	
Ink Cartridge	Special Cartridge, Special Ink Bottle	
Cartridge Type	Head/ Ink Tank Integrated Cartridge	
Ink Color	Black (BC-7000 BK/BCI-7000BK), Cyan (BC-7000 C / BCI-7000C), Magenta (BC-7000 M / BCI-7000M), Yellow (BC-7000 Y / BCI-7000Y)	
Ink Capacity	Cartridge : 44 ml each Ink Bottle : 330ml each	
Remaining Ink Detection	Provided	
Waste Ink Full Detection	Provided	
Dimension (including stand)	1500 mm × 760 mm × 1200mm/ 59 5/8" × 29 7/8" × 47 1/4" (W × D × H)	
Weight (including stand)	82 kg/ 180.8 lbs.	
Power Requirement	AC 100 – 240 V (universal), 50/ 60 Hz (common)	
Power Consumption (Max.)	150 W or less	
Power Consumption (at standby)	35 Wh	
Noise (by ISO)	At operation	50 dB or less
	At standby	35 dB or less
Operating Environment (*3)	Temperature	5 – 35°C
	Humidity	10 – 90%
Recommended Operation Environment (*3)	Temperature	17.5 – 27.5°C
	Humidity	25 – 75%
Printer Storage Environment (*3)	Temperature	5 – 35°C
	Humidity	10 – 90%
Cartridge Storage Environment (*3)	Temperature	-10 – 35°C
	Humidity	10 – 95%

(*3) Should be no condensation.

CAUTION

Specification subject to change without notice for product improvement.

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PRINT SPEED

(Paper size : A0, Unit: Min.)

Media Type	Monochrome mode			Color mode		
	DRAFT	NORMAL	ENHANCED	DRAFT	NORMAL	ENHANCED
Plain Paper	5.6	7.5	22.0	7.8	22.0	22.0
Coated Paper	5.6	7.5	36.0	7.8	22.0	22.0
GA Paper/Film	5.6	7.5	36.0	7.8	36.0	36.0

Table 1-101

(Unit: mm)

		Monochrome mode			Color mode		
		1-pass	3-pass	5-pass	1-pass	3-pass	5-pass
Cut sheet media	Leading	30	36	37	30	36	37
	Trailing	18	24	25	26	32	33
	Left/Right	5	5	5	5	5	5
Roll media	Leading	35	41	42	35	41	42
	Trailing	9	9	9	9	9	9
	Left/Right	5	5	5	5	5	5

Table 1-102

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II. NAMES OF PARTS

A. Overview

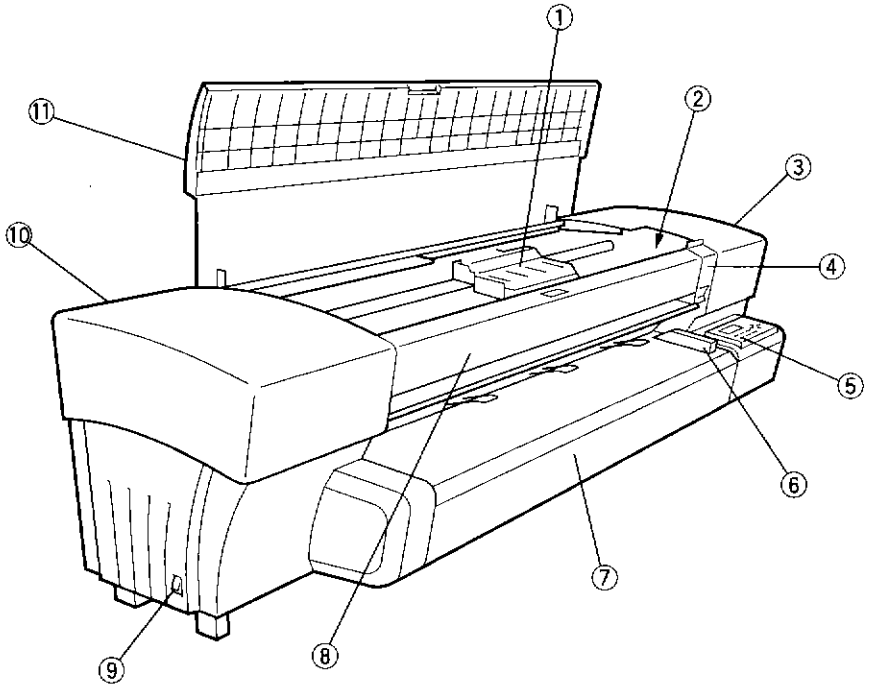

Figure 1-201

① Carriage
② Purge unit
③ Right cover
④ Feeder unit release lever
⑤ Control panel
⑥ Media guide
⑦ Roll media cover
⑧ Media discharge upper guide
⑨ Power switch
⑩ Left cover
⑪ Dust cover

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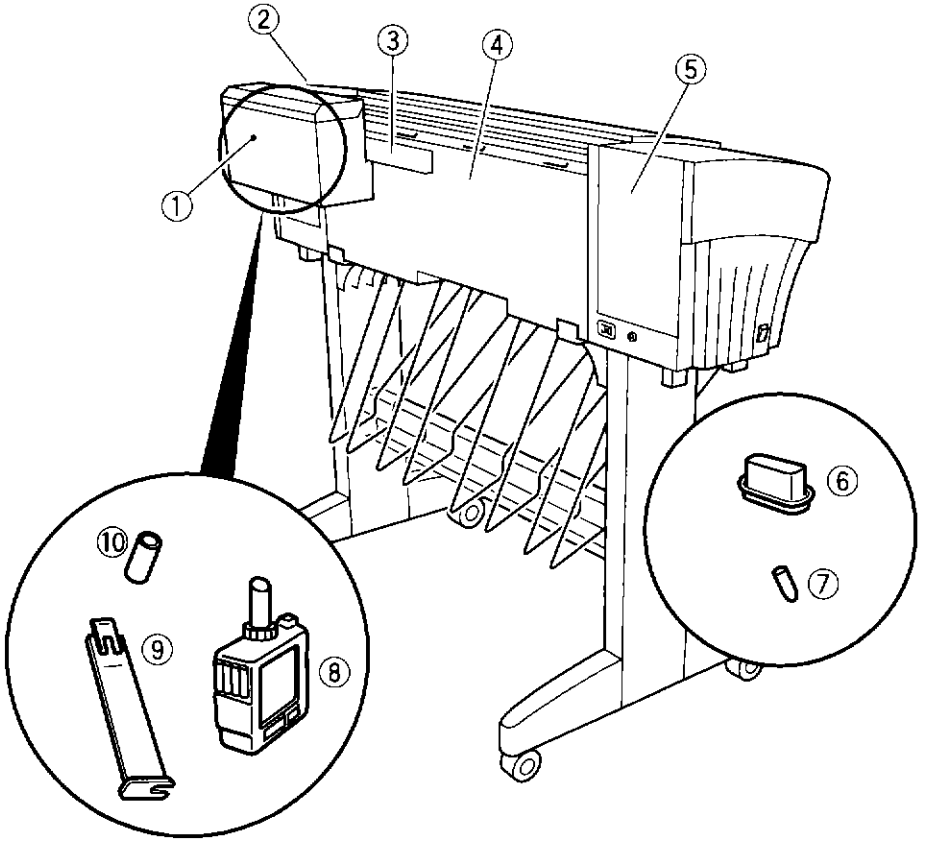

Figure 1-202

① Ink bottle case
② Right rear cover
③ Ink supply tube
④ Rear cover
⑤ Left rear cover
⑥ Buffer cap
⑦ cap
⑧ Ink Bottle
⑨ Jig Head exchange
⑩ Jig Air vent

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B. Cross-section

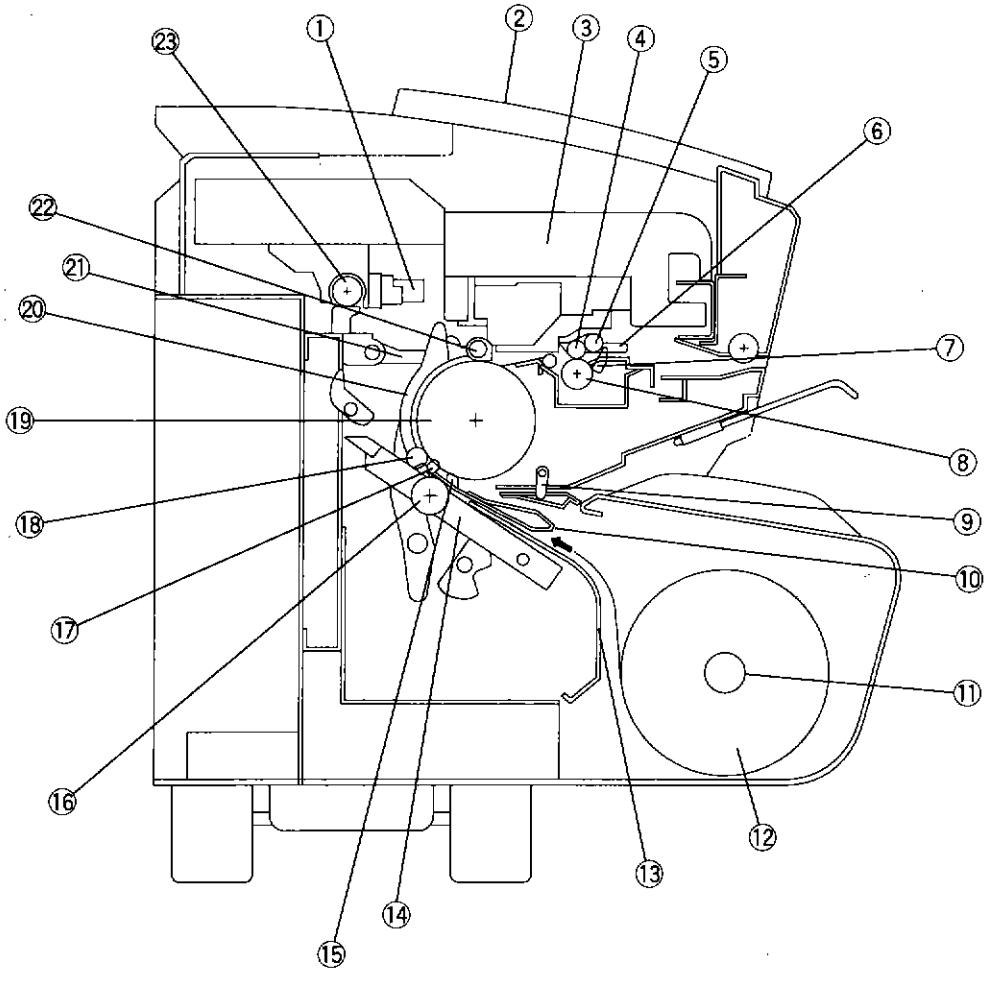

Figure 1-203

① MR sensor
② Dust cover
③ Carriage
④ Spur
⑤ Spur cleaner
⑥ Spur unit
⑦ Media discharge sensor (PS6)
⑧ Media discharge roller
⑨ Cut sheet trailing edge sensor (PS7)
⑩ Path change plate
⑪ Roll shaft
⑫ Roll media
⑬ Roll media feed guide
⑭ Media guide 1
⑮ Roll media detection sensor (PS2)
⑯ Roll media pressure roller
⑰ Cut sheet detection switch (PS1)
⑱ Pinch roller 1
⑲ Feed roller
⑳ Media guide 2
㉑ Media retainer
㉒ Pinch roller 2
㉓ Carriage rail

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C. Carriage

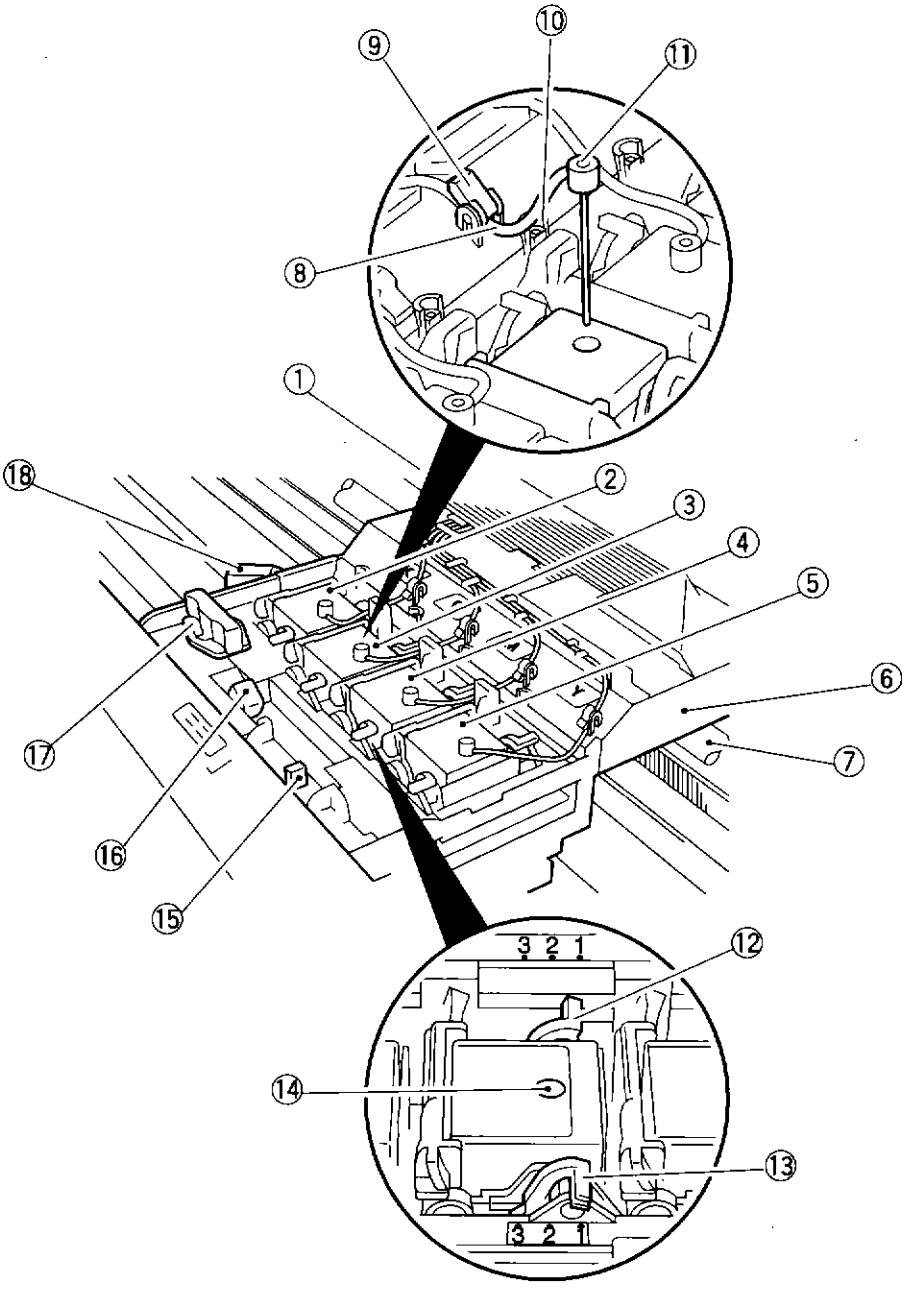

Figure 1-204

① Long flexible cable
② Bubble jet cartridge (Bk)
③ Bubble jet cartridge (C)
④ Bubble jet cartridge (M)
⑤ Bubble jet cartridge (Y)
⑥ Carriage cover
⑦ Carriage rail
⑧ Ink supply tube
⑨ Tube cock
⑩ Joint stand
⑪ Head joint
⑫ Cartridge angle adjustment lever (rear)
⑬ Cartridge angle adjustment lever (front)
⑭ Cartridge cap
⑮ Cartridge height adjustment lever
⑯ Y cutter
⑰ Cartridge fixing knob
⑱ Media sensor

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D. Roll Media Installation Unit

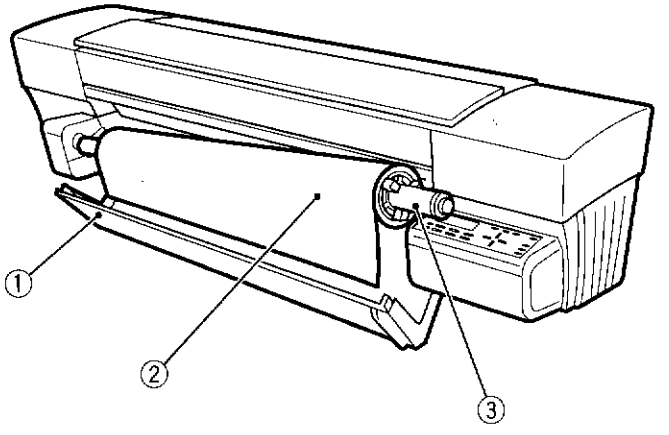

Figure 1-205

① Roll media cover
② Roll media
③ Roll shaft

E. Cable Connector

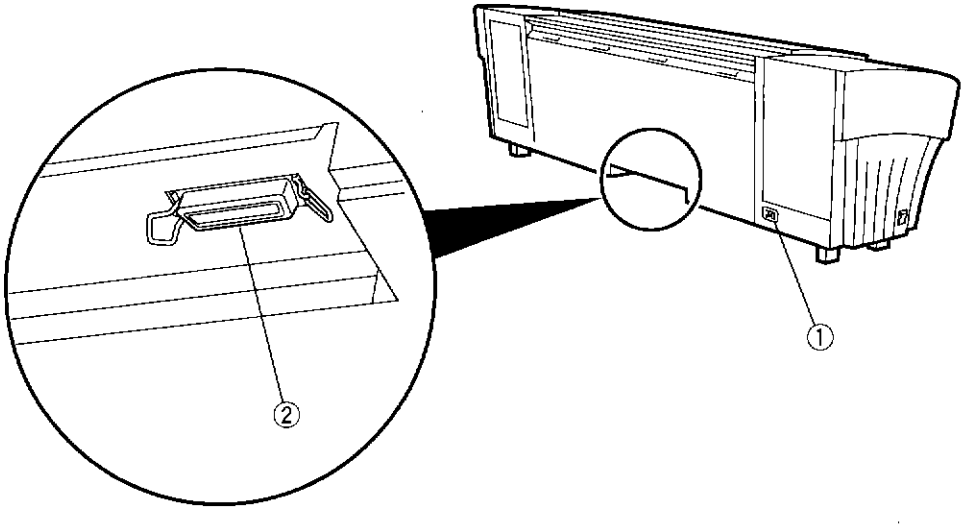

Figure 1-206

① Power cord receptacle
② Parallel interface connector

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F. Scanning Direction

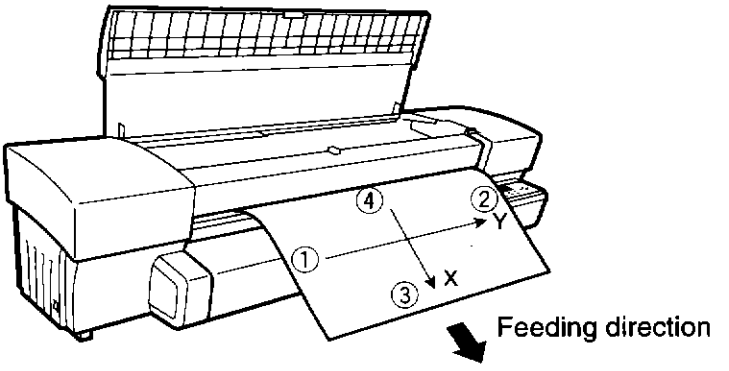

Figure 1-207

① Left edge
② Right edge
③ Leading edge
④ Trailing edge

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III. EXPLANATION OF OPERATION

A. Control Panel

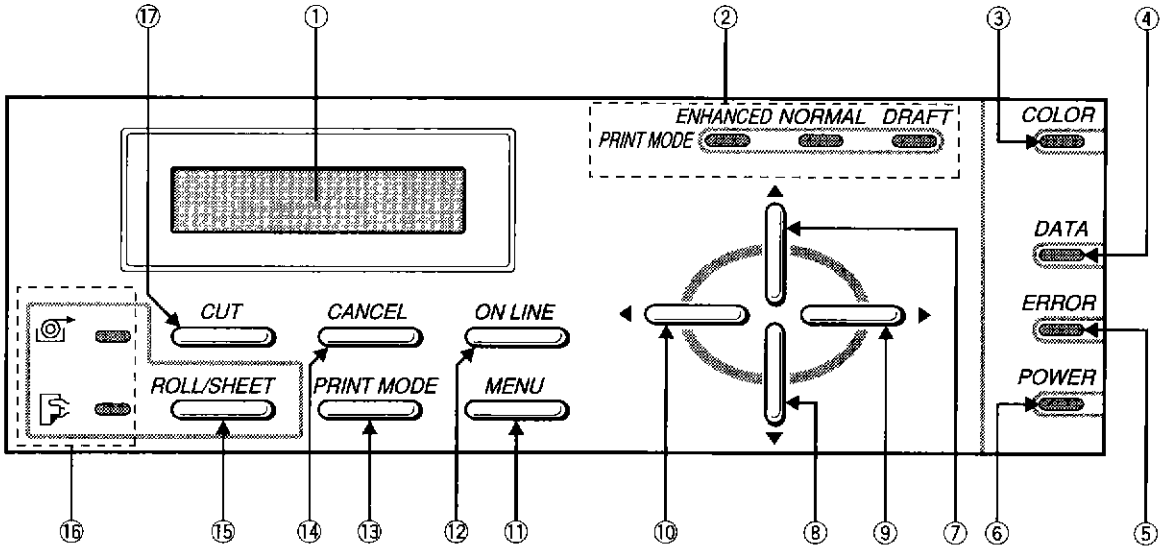

Figure 1-301

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No.	Name	Function
①	Message display	Displays menus, parameters, error messages and printer status.
②	Print mode indicator	The print mode currently selected by the PRINT MODE key.
③	Color mode indicator	Lights in the color mode when the four color cartridges are attached.
④	Data reception indicator	Lights when data is being received.
⑤	Error indicator	Lights when an error has occurred.
⑥	Pilot lamp	Lights when the power is turned ON.
⑦	Up arrow key	• Press to select the menu. • Press to discharge cut sheet media in the offline mode. • Pressing the Up arrow key in the offline mode feeds roll media in the reverse direction, and pressing the Down arrow key feeds roll media in the forward direction.
⑧	Down arrow key	
⑨	Right arrow key	• Press to select parameters. • Press to feed the carriage to the cartridge replacement position in the offline or pause modes.
⑩	Left arrow key	
⑪	MENU key	Press to display the menu screen.
⑫	ONLINE key	Press to switch between the online and offline modes.
⑬	PRINT MODE key	Press to switch the print mode. (valid only in the offline mode)
⑭	CANCEL key	Press to cancel printing. (valid only in the pause mode)
⑮	ROLL/SHEET key	Press to select the media type. (valid only in the offline mode)
⑯	Media selection indicator	The selected media is displayed lit.
⑰	CUT key	Press to cut roll media. (valid only in the offline mode)

Table 1-301

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B. Printer Status

The following diagram shows migration between printer status and key operation.

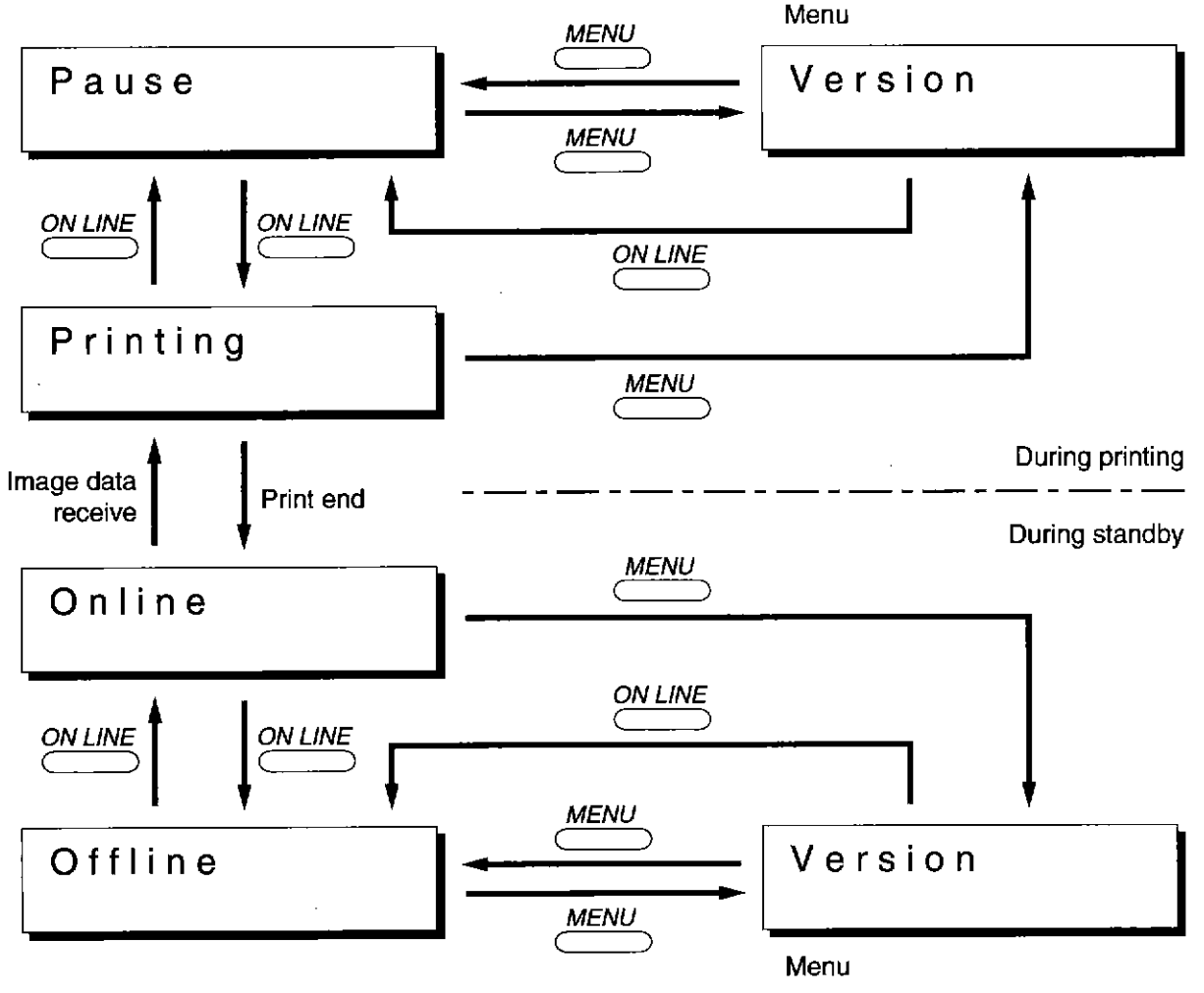

Figure 1-302

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Mode	Printer State
Online	• In this mode, the printer can receive and print data. When printing is carried out in the online mode, the display shows "Printing". • Keys on the control panel cannot be operated in the online mode. To operate keys on the control panel in this mode, the printer must first be set to the offline or menu mode.
Offline	• In this mode, received data is not printed even though the printer can receive data. If the print buffer becomes nearly full in the offline mode, the printer is set internally to the mode where data is received at 1 Byte/sec.
Pause	• In this mode data is not analyzed during printing and printing is paused. If the print buffer becomes nearly full in the pause mode, the printer is set internally to the mode where data is received at 1 Byte/sec. • In the pause mode, the printing mode can be returned to resume printing by pressing the ONLINE key, and printing can be canceled by pressing the CANCEL key.
Menu	In this mode, menus and parameters can be set. Menu items vary according to the offline or pause mode.
Printing	• Printing is being carried out. • In the printing mode, control panel keys cannot be operated. To operate control panel keys, the printer must be set to the pause or menu mode.

Table 1-302

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C. Ink bottle replacement procedure

In this machine, the amount of ink in the ink bottle is detected in two stages. When the amount of ink reaches the level ① shown in Figure 1-303 after the printing is completed, the machine is returned to off-line mode and an alarm message (Figure 1-304) is indicated on the message display on the control panel, informing the user that the ink tank is nearly empty. In this case, it is desirable for the user to prepare a new ink bottle.

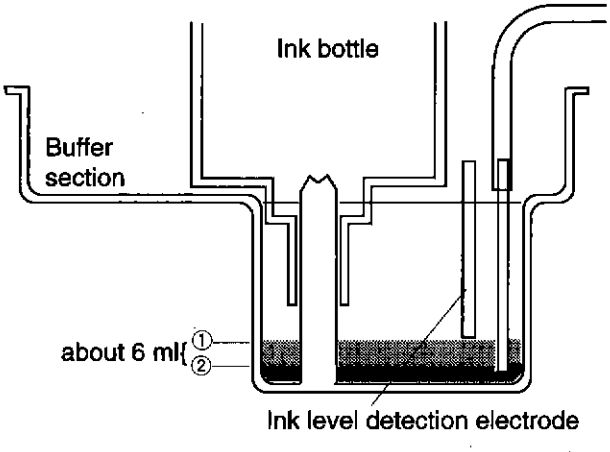

Figure 1-303

[Ink Bottle Near Empty: Cyan]

Figure 1-304

Then, the cumulative number of ink dots discharged from the head are counted. When the ink reaches level ② shown in Figure 1-303, an alarm message (Figure 1-305) is indicated on the message display on the control panel, informing the user that the ink tank is empty. In this case, when the printing is completed, the machine is stopped.

[Ink Bottle Empty : Cyan]

Figure 1-305

When the ink bottle is replaced, the bubble jet cartridge should also be replaced. However, when the cartridge is replaced after the ink in the cartridge becomes empty, the replacement procedure is described in 1-12 page.

Ink bottle replacement procedure

1) Open the ink bottle case.
2) Push the ink bottle hook and remove the ink bottle.

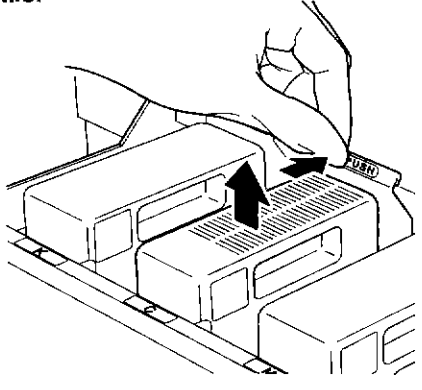

Figure 1-306

Note:
Remove the ink bottle only after cleaning the opening of the ink bottle so that no ink is splashing.

Reference:
Attach a cap to the old ink bottle, which has to be disposed as noncombustible waste.

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3) Remove the new ink bottle from its package and remove the ink cap.

4) Insert the air vent tool into the ink bottle as shown in Figure 1-307.

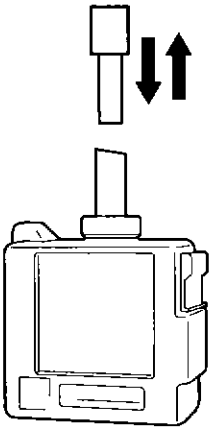

Figure 1-307

5) Set the ink bottle in the ink bottle case.

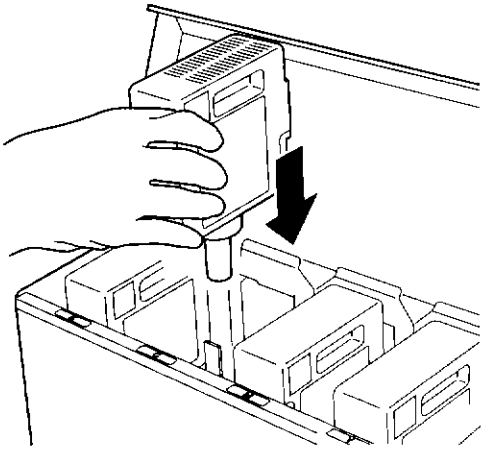

Figure 1-308

6) Put the ink cap on the ink cap stand.

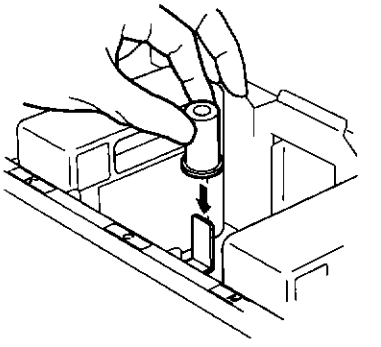

Figure 1-309

7) Set the new bubble jet cartridge. (Refer to the D. bubble jet cartridge replacement procedure).

Note:
Remove the ink bottle as little as possible, except in the case of replacing it, otherwise the ink at the buffer section might run over.

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D. Bubble jet cartridge replacement procedure

Basically, the bubble jet cartridge has to be replaced at the time of the replacement of the ink bottle.

Replacement procedure

1) When the machine is off-line mode, press the right or left arrow key.
The carriage will be moved to the carriage replacement position automatically.

2) Open the dust cover.

3) Turn the tube cock to the arrow direction to stop the supply of ink.

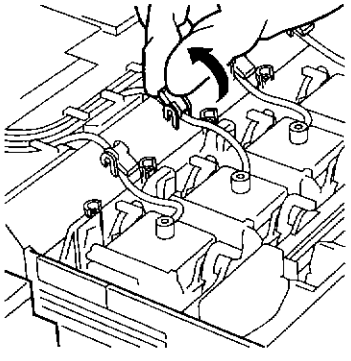

Figure 1-310

4) Take out the head changing jig from the ink bottle case and remove the head joint from the bubble jet cartridge using the jig as shown in Figure. 1-311.

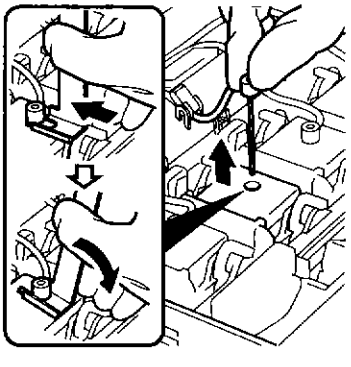

Figure 1-311

5) Insert the removed head joint into the hole of the joint stand on the carriage.

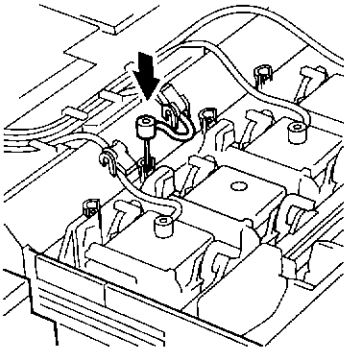

Figure 1-312

6) Turn the cartridge fixing knob clockwise to the position [FREE], while pressing it down.

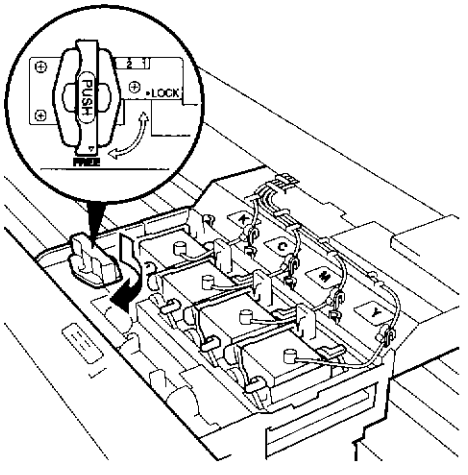

Figure 1-313

7) Remove the empty cartridge.

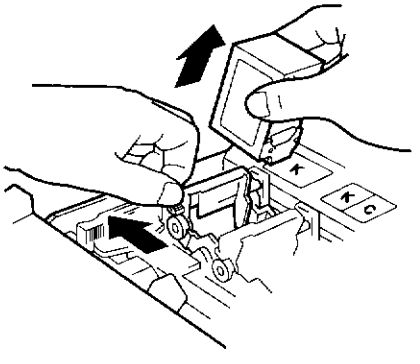

Figure 1-314

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Note:

- Be careful not to touch the aluminum board on the cartridge after printing because the temperature of the board might be high.
- When the cartridge is handled, be careful not to touch the head and electrode sections.

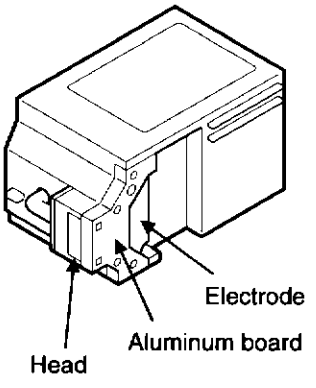
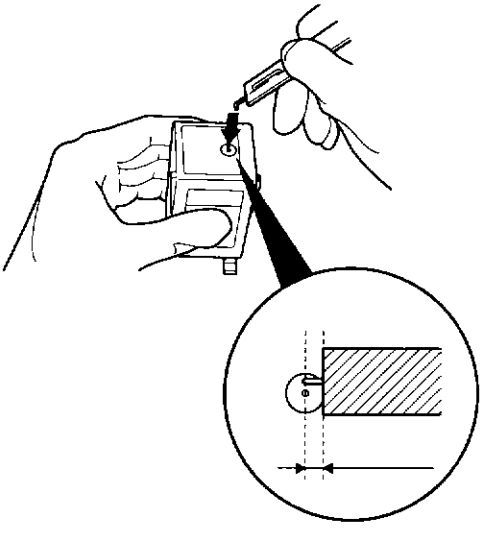


Figure 1-315

8) Open the package of the new cartridge.

9) Insert the end of the head changing jig into the hole on the cartridge cap. Then, detach the cartridge cap. Return the jig to the ink bottle case.



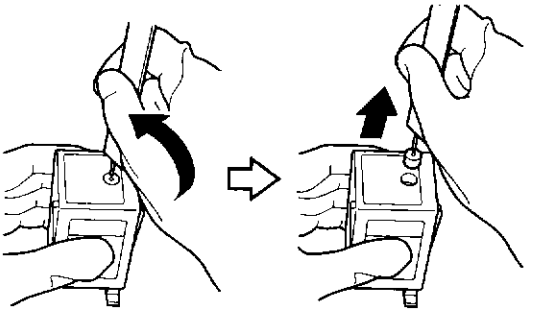


Figure 1-316

10) Detach the cartridge protective cap.

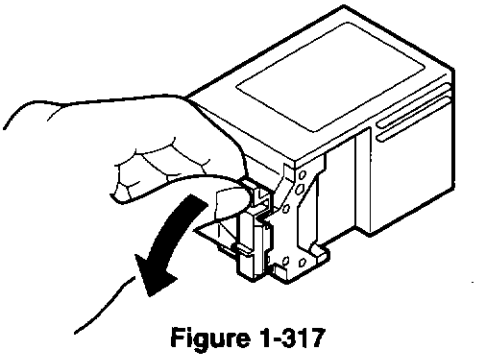


Figure 1-317

Note:
Be careful not to touch the electrode part of the cartridge.

11) Remove the protective seal.

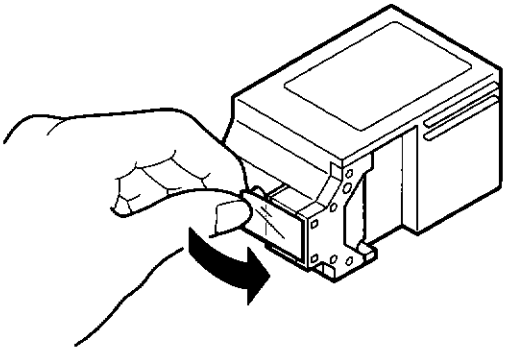


Figure 1-318

Note:
Be careful not to touch the head and electrode parts of the cartridge.

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12) Set the cartridge with its head down and electrode to the right.

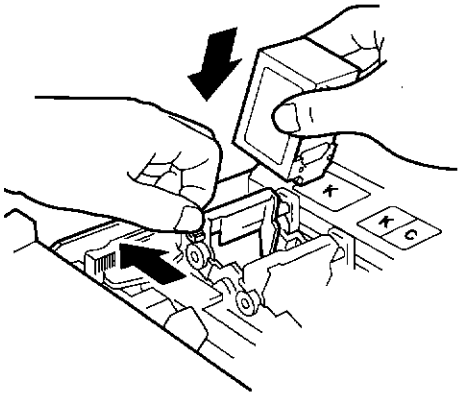

Figure 1-319

Note:
Be careful so that the head doesn't touch the carriage.

13) Turn the cartridge fixing knob counterclockwise, while pressing it down.

14) Return the tube cock to the original position.

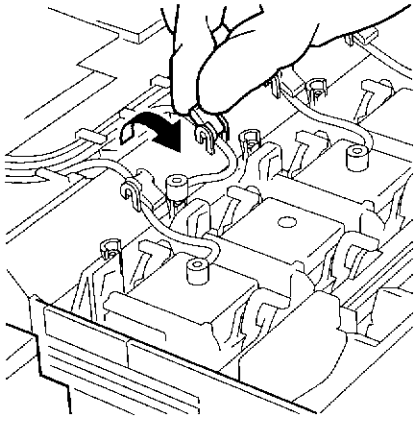

Figure 1-320

15) Insert the head joint securely into the hole on the upper cartridge.

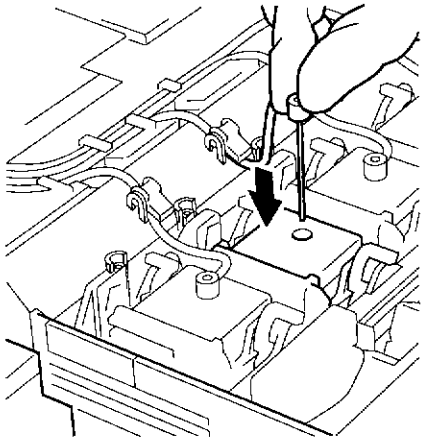

Figure 1-321

16) Close the dust cover.
- The carriage will return to the home position automatically and head cleaning will be performed.

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E. How to use up the bubble jet cartridge ink

In the case that there is no spare ink bottle and the ink in the ink bottle is empty, by performing the following procedure, printing is available using the cartridge only. However, as the detection of the ink in the cartridge is not available, prepare a new ink bottle and a new cartridge as soon as possible.

1) When the machine is off-line or in pause mode, press the right or left arrow key.
   - The carriage will move to the cartridge replacement position automatically.

2) Open the dust cover.

3) Turn the tube cock to the arrow direction to stop the ink supply.

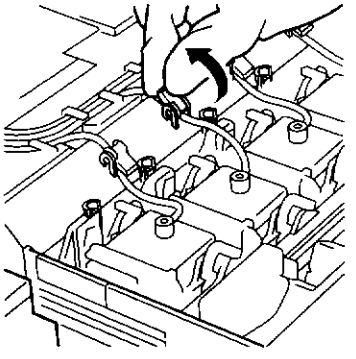

Figure 1-322

Note:
Make sure to close the tube cock.

4) Take out the head changing jig from the ink bottle case. Remove the head joint from the bubble jet cartridge as shown in Figure 1-323.

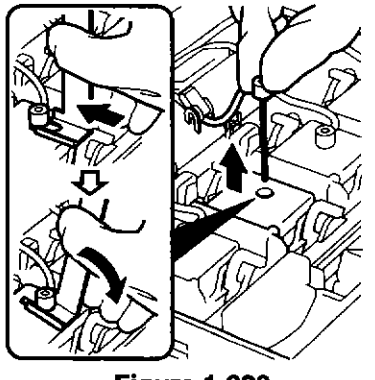

Figure 1-323

5) Insert the removed head joint into the hole of the joint stand on the carriage.

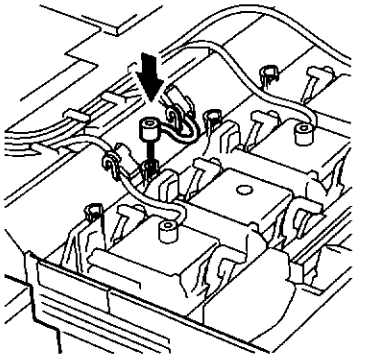

Figure 1-324

Note:
Make sure to remove the head joint from the cartridge and place it on the joint stand.

6) Pressing the paper selection key indicates the following message on the message display.

```
Cartridge Mode
No
```

Figure 1-325

7) Select "YES" pressing the left or right arrow key.

8) Press the ONLINE key or MENU key.

9) Close the dust cover.

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F. User Mode Menu

1. Setting Menus and Parameters

Follow the procedure below to set printer menus and parameters.

1) Press the MENU key to set the printer to the menu mode.
2) Select the desired menu item by pressing the Up or Down arrow key.

CAUTION

Menus that are displayed vary according to the offline or pause mode.

3) Select the desired parameter by pressing the Right or Left arrow key.
4) To fix a parameter setting, press one of the ONLINE, MENU, Up or Down arrow keys.

CAUTION

In the case of menus that are immediately executed such as "Head Cleaning", "Adjustment" or "Setup List", the operation is started by pressing one of the ONLINE, MENU or Down arrow keys. However, note that when the Up arrow key is pressed, the operation is not started, and the selected parameter will be canceled.

2. Details of User Mode Menus

The following table shows the configuration of user mode menus on this printer.

(Bold lettering indicates factory settings.)

Menu Name	Parameter Name/Function		Remarks
Version	Displays the version of the engine controller and image controller.		
Auto Cut	Sets automatic cutting to ON or OFF after roll media has been printed.		
	Yes	Cut after end of printing	
	No	Do not cut after end of printing	
	Cut Line	Print a cutting line after the end of printing.	
Head Cleaning	This menu allows you to manually clean cartridges.		
	No	The head cleaning is not carried out.	
	All	All cartridges are not cleaned.	
	Black	The Black cartridge is cleaned.	

Table 1-303 (1/3)

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Menu Name	Parameter Name/Function		Remarks
Print Frequency	This parameter allows you to set the head drive frequency. Non-discharge of ink may occur depending on the pattern pitch or length when printing out specific vertical striped patterns that are aligned at a fixed cycle in the form of a bar code in the 1-pass print mode. If this happens, changing the head drive frequency can eliminate non-discharge of ink.		This can be set only in the 1-pass print mode.
	10 kHz	Printing is driven at 10 kHz.	
	8 kHz	Printing is driven at 8 kHz.	
	6.75 kHz	Printing is driven at 6.75 kHz.	
Media Type	This parameter allows you to select the media type. The print path varies according to the combination "Media Type" setting and the print mode setting on the control panel. (See Table 1-304.)		This can be set only in the offline mode.
	Coated Paper	Heavyweight coated media	
	Plain Paper	Plain paper	
	GA Paper/Film	Glossy media, Semi-gloss media, Glossy film, Back print film	
EOP Timer	This parameter allows you to set when to end data transfer after the last data sent from the computer has been received. This setting prevents the printer from entering the data standby mode when the data end command could not be received.		
	30 seconds	30 secs. later	
	1 minute	1 min later	
	2 minutes	2 min later	
	5 minutes	5 min later	
	10 minutes	10 min later	
	30 minutes	30 min later	
	60 minutes	60 min later	
	10 seconds	10 secs. later	
Alarm Set	This menu allows you to switch the buzzer ON or OFF.		
	On	Buzzer ON	
	Off	Buzzer OFF	

Table 1-303 (2/3)

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Menu Name	Parameter Name/Function		Remarks
Adjustment	This menu allows you to adjust images.		
	No	The adjustment is not carried out.	
	Head (Auto)	The auto head adjustment is carried out.	• Settable only in offline mode • A3/11" × 17" size (portrait) or larger
	Head (User)	The manual head adjustment is carried out.	• Settable only in offline mode • A3/11" × 17" size or larger
	Band	The media feed amount is adjusted.	• Settable only in color mode • A3/11" × 17" size (portrait) or larger
	Head Angle	The cartridge angle is adjusted.	• Settable only in offline mode • A3/11" × 17" size or larger
Setup List	This menu allows you to output check patterns built into the printer.		A4 landscape or larger
	No	The check pattern is not output.	
	Yes	The check pattern is output.	

Table 1-303 (3/3)

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Cartridge	Media Type	Print Mode		
		DRAFT	NORMAL	ENHANCED
Monochrome Mode	Coated Paper	1-pass bi-direction	1-pass uni-direction	5-pass uni-direction
	Plain Paper	1-pass bi-direction	1-pass uni-direction	3-pass uni-direction
	GA Paper/Film	1-pass bi-direction	1-pass uni-direction	5-pass uni-direction
Color Mode	Coated Paper	1-pass uni-direction	3-pass uni-direction	3-pass uni-direction/ black-enhanced
	Plain Paper	1-pass uni-direction	3-pass uni-direction	3-pass uni-direction/ black-enhanced
	GA Paper/Film	1-pass uni-direction	5-pass uni-direction	5-pass uni-direction/ black-enhanced

Table 1-304

3. How to Use Setup List

Setup List is provided as a function for outputting a test print. This test print is used for judging whether or not printer problems lie with the printer or the computer. Test prints also include nozzle check patterns which are used for checking from which nozzles ink is not being discharged.

The current menu setup, service mode settings and histories of the past three occurring errors are also printed out on the Setup List. The user can use then as a record of menu setups, or send them by fax for use in servicing.

Figure 1-326 shows a sample Setup List, and Table 1-305 shows printer information that is output in the Setup List.

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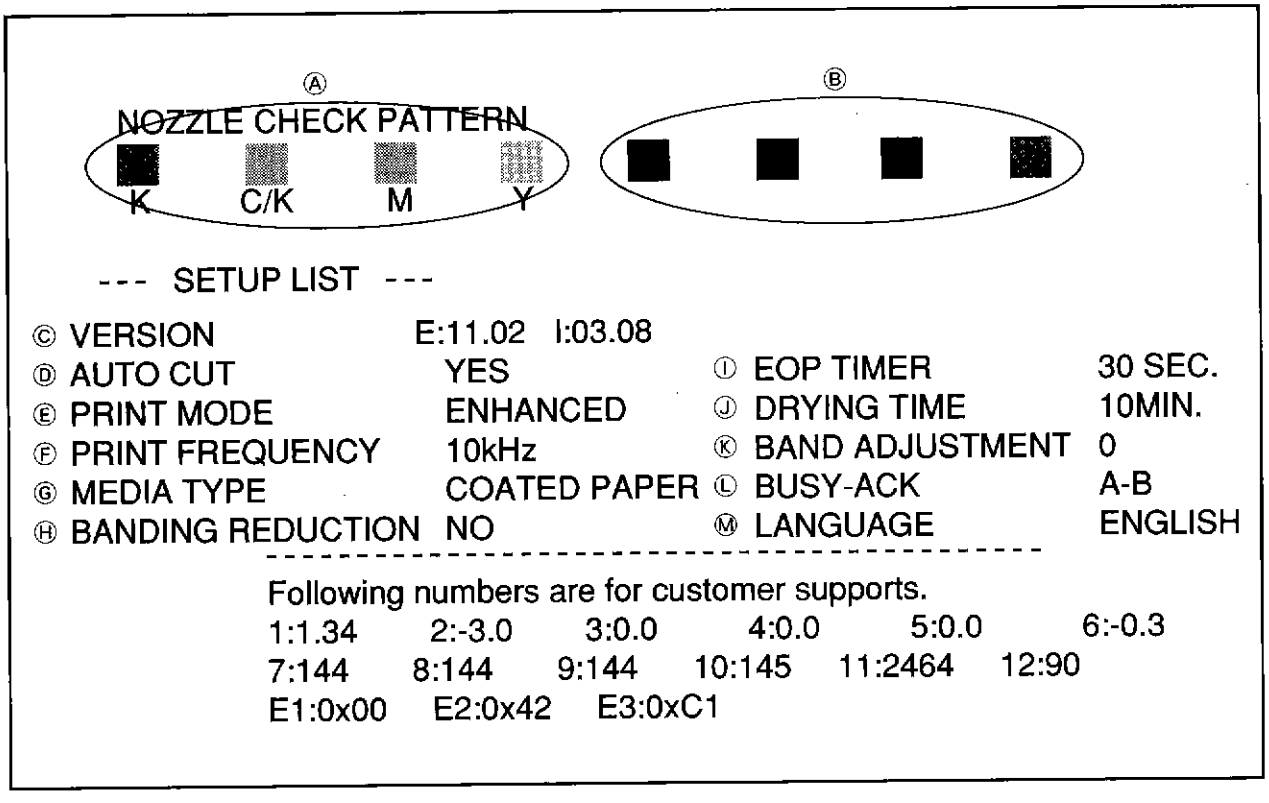

Figure 1-326

No.	Description	No.	Description
A	Nozzle check pattern (4 lines × 30 rows)	2	Media length offset value
B	Fill pattern for each color	3	Leading edge margin offset value
C	E : Engine controller version I : Image controller version	4	Left margin offset value
		5	Trailing edge margin offset value
D	Current Auto Cut setup	6	Media retainer hook position adjustment value
E	Current Print Mode setup	7	Head temperature sensor offset value (Bk)
F	Current Print Frequency setup	8	Head temperature sensor offset value (C)
G	Current Media Type setup	9	Head temperature sensor offset value (M)
H	Current Banding Reduction	10	Head temperature sensor offset value (Y)
I	Current EOP Timer setup	11	Waste ink counter value
J	Current Drying Time setup	12	Total Printing Time value
K	Current Band adjustment setup	E1	Error display history (latest indication)
L	Current Busy-Ack setup (See page 5-14.)	E2	Error display history (previous indication)
M	Message Language setup	E3	Error display history (previous-previous indication)
1	Room temperature thermistor offset value		

Table 1-305

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G. Basic Operation Procedure

1) Turn the power switch ON.
   - The pilot lamp lights, and the printer starts initial operation.
2) After initial operation ends, select the media.
   - To select the media type, press the ROLL/ SHEET key.
3) Load media into the printer.
   a. When using cut sheet media, insert the media into the cut sheet feed inlet. At this time, make sure that the media is inserted within 7 mm of the media guide.

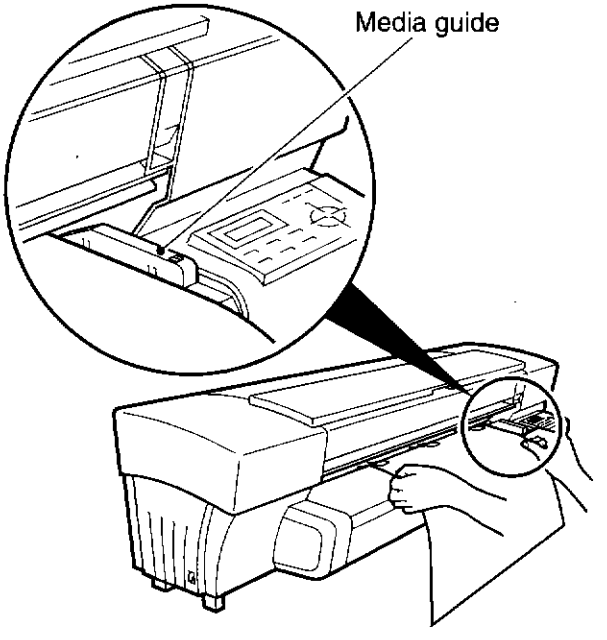

Figure 1-327

- The printer loads the inserted media.
- The printer then detects the media width, length and skewed feed. After this, the printer feeds the media to the print start position.
- When the skewed feed is detected, the printer carries out the following operation.

i) The media is fed to the media exit if it is less than 50 cm/20".

ii) If the media is 50 cm/20" or longer, feeding of the media is stopped. Follow the procedure below to remove skew.

① Open the dust cover, and pull the feeder unit release lever towards you to release feeder unit.

② Align both edges of the media, return the feeder unit release lever to its original position, and close the dust cover.

- The printer then detects the media width, length and skew again.

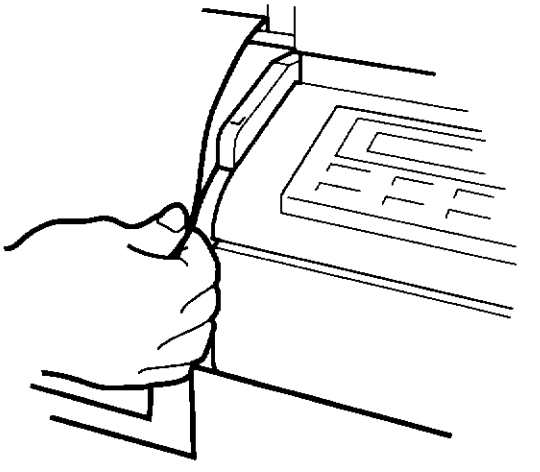

Figure 1-328

b. When using roll media, open the roll media cover, and insert the media aligning it with the line on the right of the roll media feed inlet.

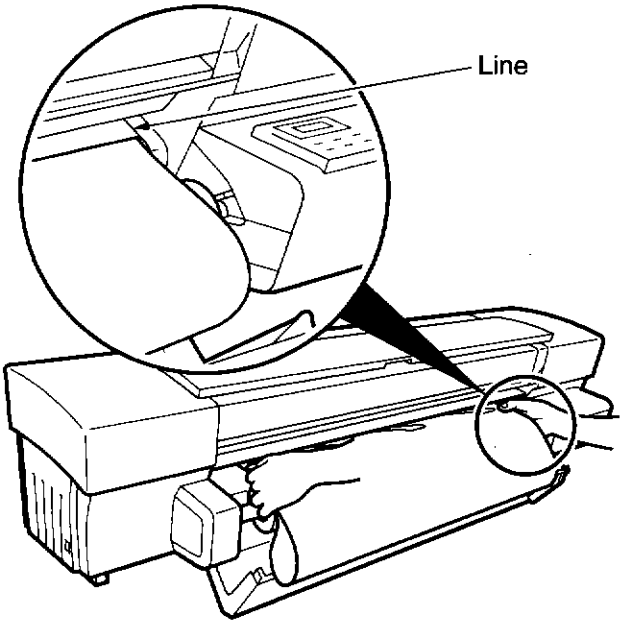

Figure 1-329

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- The printer loads the inserted media, and discharges the leading edge of the media from the media exit.
- Align the media edge as follows.
  ① Lift up the dust cover, and pull the feeder unit release lever towards you to release the feeder unit.
  ② Align the both edge of the media, return the feeder unit release lever to its original position, and lower the dust cover.

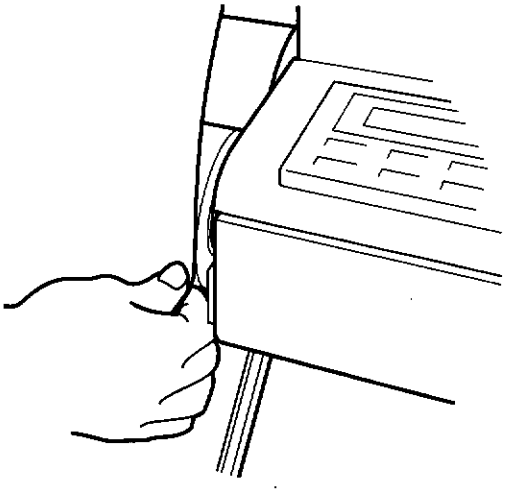

Figure 1-330

- The printer then detects the media width and skewed feed. After this, the printer trims the leading edge of the media, and feeds the media to the print start position.
- If the printer detects skewed feed, the printer stops feeding. Align the media edge again.

4) Set up menus and parameters as necessary.
5) Press the ONLINE key twice.
   - The printer leaves the menu display, and enters the online mode.
6) Transfer the file data from the computer.
   - The printer starts printing.
   - To stop printing midway, press the ONLINE key to set the printer to the pause mode.
7) After the print has ended, remove the media from the printer.

CAUTION

When loading media, do not touch the printing surface with your hands. If oil from your hands touches the printing surface, this might cause uneven printing or smudging to occur.
Do not touch ink areas after printing.

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H. Cartridge Height Adjustment Lever

When printing high-density graphics, the media sometimes becomes wavy causing it to rise up from the platen and brush against the head depending on the type and thickness of the media being used.

To prevent this, the clearance between the head and platen can be adjusted in three stages by the cartridge height adjustment lever.

1) Press the Left or Right arrow key in the offline or pause mode.
   - The carriage moves to the cartridge replacement position.
2) Open the dust cover.
3) Slide the cartridge height adjustment lever to adjust the cartridge height.

   ● : Standard position

   ⁝ : Position when printing graphics

   ⋮ : Position when printing high-density graphics. (largest clearance between head and platen)

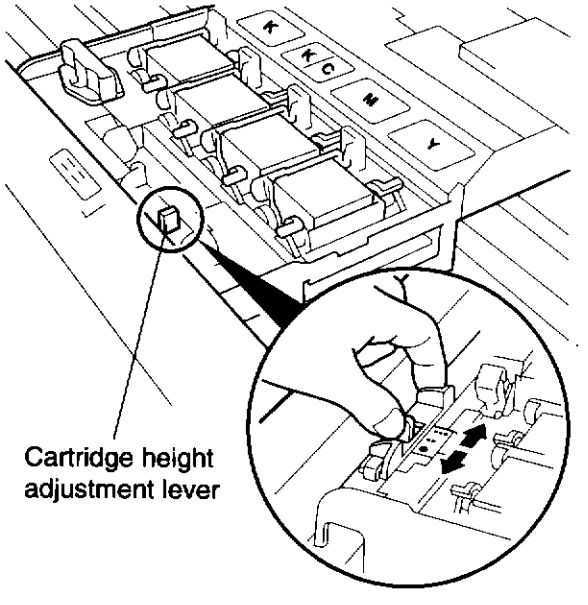

Figure 1-331

4) Close the dust cover.
   - The carriage returns to its home position.

CAUTION

If the clearance between the head and the platen is too large, ink is more likely to be discharged out of position. For this reason, do not move the cartridge height adjustment levers except when the head is rubbing against the media on the platen.

I. Head Adjustment

The nozzles sometimes become out of alignment between different color cartridges depending on the mounting condition of the cartridge. This, in turn, causes the dotted positions of each of the color inks discharged from the head to become out of alignment.

Head adjustment is a function for adjusting this misalignment. Head adjustment is provided with two modes: auto and manual. By auto head adjustment, the printer automatically adjusts registration, and by manual head adjustment, the user visually selects offset values from a test pattern output from the printer.

Carry out manual head adjustment when precision adjustment is required or when adjustment must be carried out in a short time.

CAUTION

This adjustment must be carried out after the cartridge has been released by turned the cartridge fixing knob, for example, after the cartridge has been replaced.

1. Auto Head Adjustment

1) Load A3/11" x 17" media on the printer.
2) Select "Head (Auto)" in the "Adjustment" user menu, and press one of the Down arrow, ONLINE or MENU keys.
   - The printer automatically determines the offset values by reading the printed out pattern by the media sensor.
   - It takes about six minutes for this adjustment to end.

CAUTION

Make sure that the cartridge height adjustment lever is set to the standard position (●) when carrying out auto head adjustment.

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2. Manual Head Adjustment

1) Load A3/11" × 17" media on the printer.
2) Select "Head (User)" in the "Adjustment" user menu, and press one of the Down arrow, ONLINE or MENU keys.
   - The printer outputs the head adjustment pattern.
   - It takes about 30 seconds for the printer to output the head adjustment pattern.

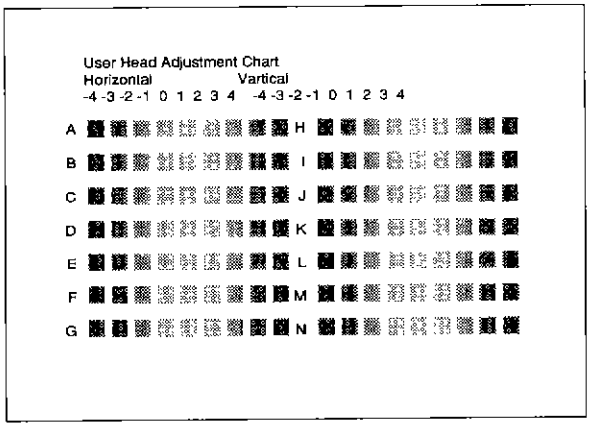

Figure 1-332

3) From pattern A (Black and Cyan vertical lines) select the No. where lines overlap each other the most using the Left or Right arrow key.
   - Select within the range -4 to 4.
   - The current setup is always output at position 0.
   - In the example in Figure 3-310, select "2".

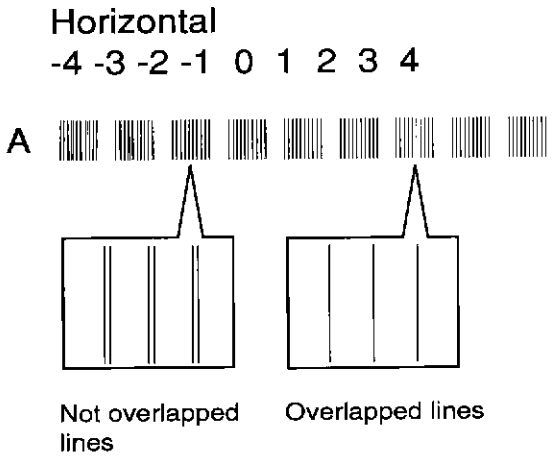

Figure 3-333

4) Press the Down arrow key.
   - The screen for entering setting value B is displayed.
5) Following the same procedure as above, enter the setting values up to N, and press the Down arrow key.

CAUTION
The setting in the monochrome mode is A to F.

6) To store the setting values to the printer, press "Enter". To cancel changes made to settings and return the setup to its original values, press the Left or Right arrow key to display "Reset". Next, press any of the Down arrow, ONLINE or MENU key.

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J. Media Feed Adjustment

When the media feed is inappropriate, stripes will appear in the Y-axis direction between image bands. If this happens, follow the procedure below to adjust the media feed.

1) Load A3/11" × 17" media on the printer.
2) Select "Band" in the "Adjustment" user menu, and press one of the Down arrow, ONLINE or MENU keys.
   - The printer prints out the media feed adjustment pattern.

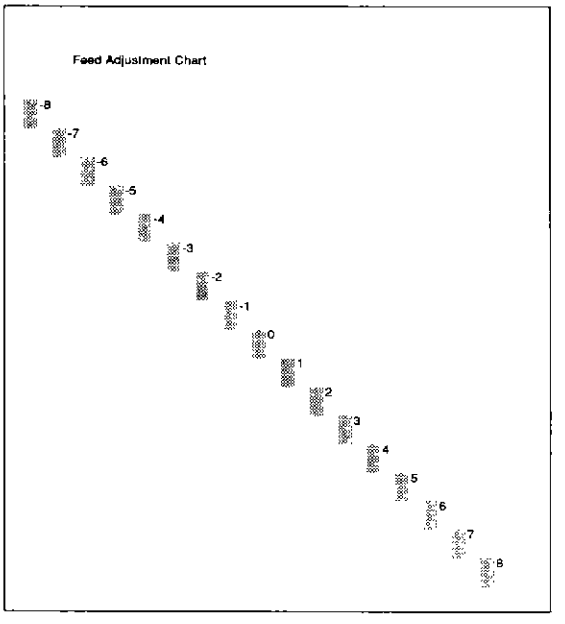

Figure 3-334

3) From the printout pattern, select the No. where stripes between bands is least conspicuous using the Left or Right arrow key.
   - Select within the range -8 to 8.
   - In the example in Figure 3-335, select "-2".

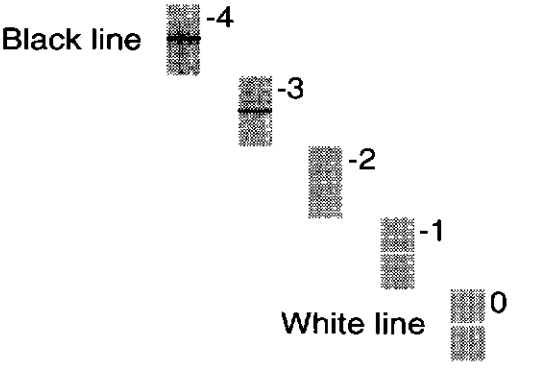

Figure 3-335

Reference

Decrementing the setting value by "1", changes the feed by approx. 1/8 dot (approx. 0.0088 mm).

4) Press one of the Down arrow, ONLINE or MENU keys to store the setting value to the printer.

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K. Cartridge Angle Adjustment Lever

Slanted lines sometimes occur in the X-axis direction as shown in Figure 1-336 depending on the installation condition of the cartridge and on the condition of the cartridge. If these slanted lines are conspicuous, the cartridge angle adjustment lever can be moved to adjust the angle of the cartridge.

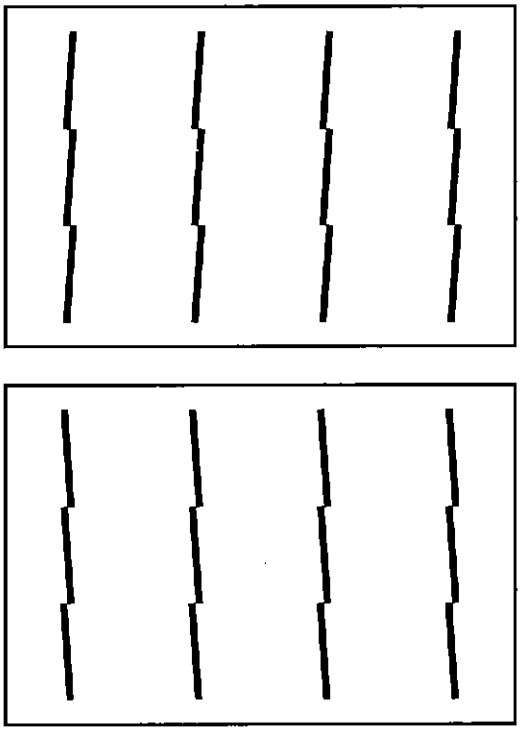
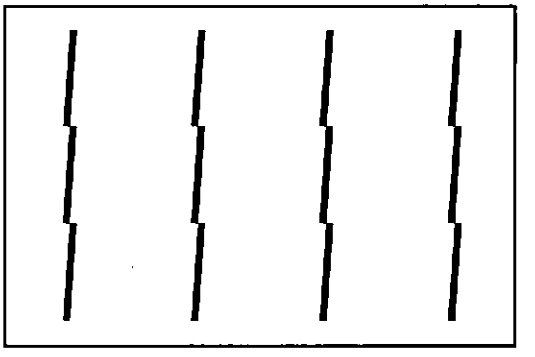


Figure 1-336

1) Load A3/11" × 17" media on the printer.
2) Select "Head Angle" in the "Adjustment" user menu, and press the ONLINE key.
   - The cartridge angle adjustment pattern is printed.
3) Check which cartridge is causing the slanted lines on the printed pattern.
4) Press the ONLINE key to set the printer to the offline mode, and press the Left or Right arrow key.
   - The carriage moves to the cartridge replacement position.
5) Open the dust cover.
6) When slanted lines appear at the angle shown in Figure 1-337, set the cartridge angle adjustment lever at the rear side of the cartridge where the slanted lines occurred to position 2.



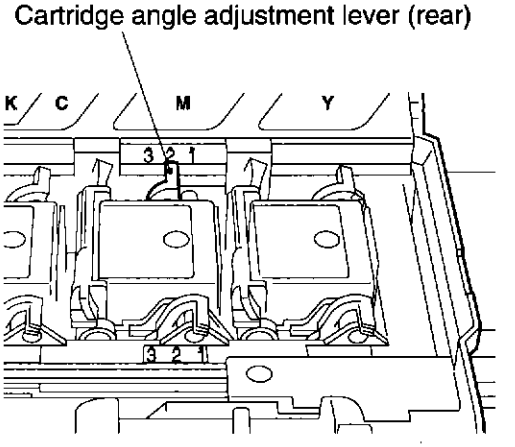


Figure 1-337

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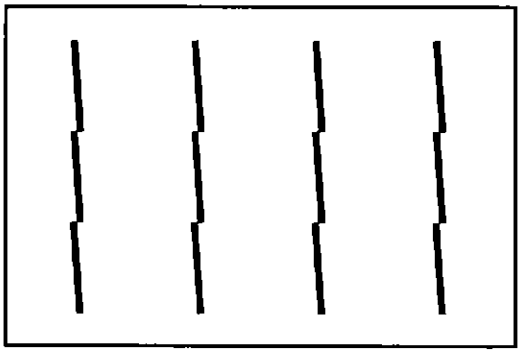
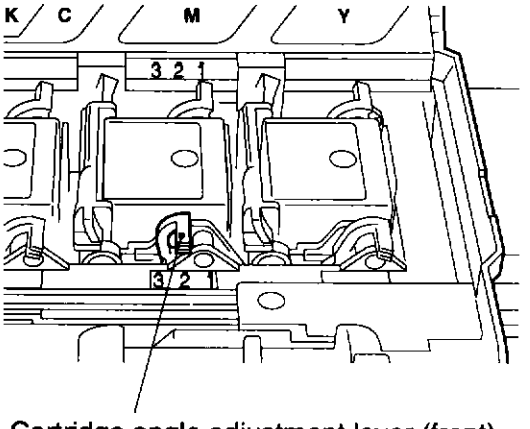
7) When slanted lines appear at the angle shown in Figure 1-338, set the cartridge angle adjustment lever at the front side of the cartridge where the slanted lines occurred to position 2.





Cartridge angle adjustment lever (front)

Figure 1-338

CAUTION
One of the front or rear cartridge angle adjustment levers must be set to position 1 (standard position).

8) Close the dust cover.
   - The carriage returns to the home position.
9) Print out the cartridge angle adjustment pattern to whether or not the slanted lines are now straight.
10) If the adjustment has not corrected the problem, move the carriage to the cartridge replacement position, and set the cartridge angle adjustment lever to position 3.

CAUTION
To return the cartridge angle adjustment lever to its original position, turn the cartridge fixing knob. All cartridge angle adjustment levers can be returned to position 1 by releasing the cartridge attachment on the carriage. This is because strict repeatability cannot be obtained by manually returning the cartridge adjustment levers to their original positions.

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IV. WARNINGS AND REMEDIES

A. Ink bottle replacement display

The ink level in the ink bottle is detected using the ink level sensor in the ink bottle case. When the ink level is lowered, the following messages are indicated on the message display.

(In the case of the black ink cartridge)

K	Ink OK
k	Ink bottle Near Empty
-	Ink bottle Empty

Table 1-401

When the tank is nearly empty, prepare a new ink bottle. When the Ink bottle is empty, replace the ink bottle and bubble jet cartridge with a new ink bottle and a cartridge at the same time.

B. Waste ink tank full display

This printer detect the amount of ink in the waste ink tank by counting the number of ink suction.

The alarm message is displayed on the control panel when the rest of the waste ink tank capacity becomes approx. 250ml.

[Call Customer Support :
Waste Ink Tank is Nearly Full]

Figure 1-401

Thereafter, error code [C8] will be displayed on the control panel when the waste ink tank becomes full. To reset error : [C8], replace the waste ink tank and reset the waste ink counter with the service mode.

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C. Media Feed Inspection Display

When a media jam occurs during loading or printing, the error display on the printer lights, and the media jam message is displayed on the message display. When this happens, follow the procedure below to remedy the problem.

1) Lift up the dust cover.
2) If the carriage is on the platen, return the carriage by hand to its home position.
3) Lower the feeder unit release lever to release the feeder unit.
4) If the leading edge of the media is not at the media exit, remove the media from the media feed inlet or from the platen.

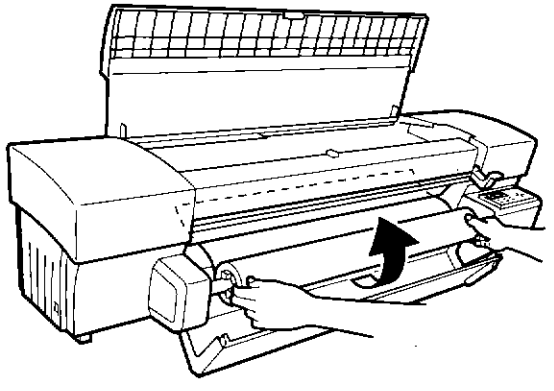

Figure 1-402

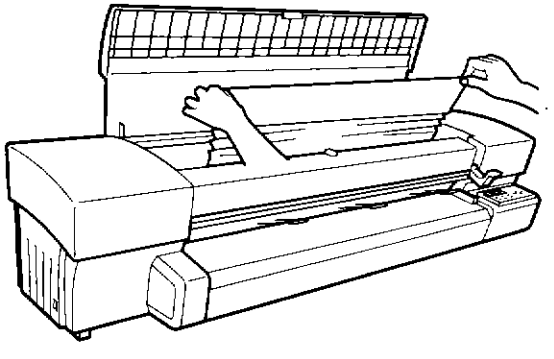

Figure 1-403

5) If the leading edge of the media is at the media exit, remove the media from the media exit.
   - In the case of roll media, open the roll media cover, cut the roll media and remove from the printer.

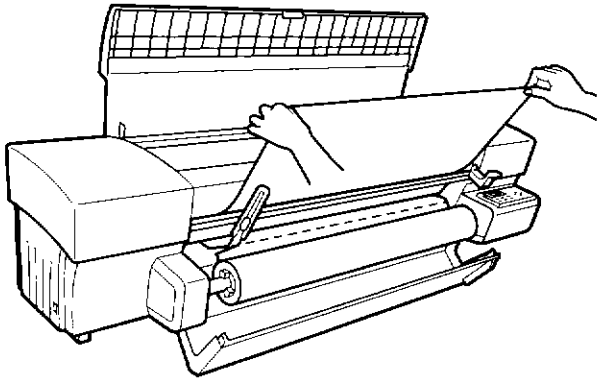

Figure 1-404

6) Close the roll media cover and return the feeder unit release lever to its original position, and lower the dust cover gently.

CAUTION
After clearing the media jam, check the printer for any remaining scraps of media.

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D. Cutter Inspection Display

When roll media is not being cut properly by the Y cutter, the error indicator on the printer lights and the error message is displayed on the message display. If this problem occurs frequently or worsens, replace the Y cutter. Follow the procedure below to replace the Y cutter.

1) Press the left or right arrow key in the offline mode or pause mode.
   - The carriage moves to the cartridge replacement position.
2) Lift up the dust cover.
3) Remove the cutter holding it by the knob.

CAUTION
The cutter blade is sharp. Do not touch this blade.

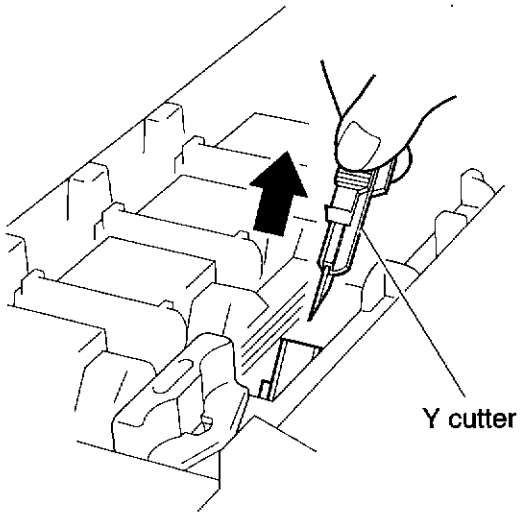

Figure 1-405

4) Install the new cutter on the carriage.

CAUTION
Insert it until you hear it click into place.

5) Lower the dust cover gently.
   - The carriage returns to its home position.

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V. HANDLING PRECAUTIONS

Pay attention to the following points when handling the printer.

A. Bubble Jet Cartridge

- Do not touch the head surface.
- Do not wipe the head surface with cloth or paper.
- Do not touch the electrode.
- Do not subject the cartridge to shock or impact.
- Do not place cartridge removed from the carriage face down.
- Do not shake cartridge after peeling off the protective tape. Doing so might cause ink to splash.
- Remove the cartridge from the printer only for replacement.
- Open the package of the new cartridge immediately before replacing.
- Do not dismantle or modify the cartridge.

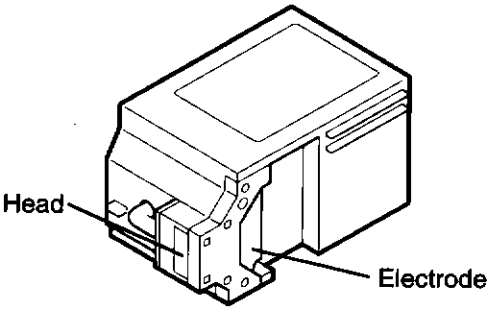

Figure 1-501

B. Media Storage Conditions

- Store the media in a place where the relative humidity range is 25 to 75%. If using the printer in an environment where the relative humidity is outside of this range, unpack the media and allow it to acclimatize for some time before loading.
- Wrap media in its package, and store in a low-moisture location out of the direct sunlight.
- Store media on flat surface.

C. Media

- Hold media by its edges to prevent oil on your hands adhering to the media. It is recommended wearing cotton gloves.
- Do not use curled, folded or wrinkled media.
- Before using media, take media out of its package one sheet at a time.
- Wrap left-over media in the wrapping paper, and store in a low-humidity location out of the direct sunlight.

D. Printed Media

- Ink is water-soluble. So, do not touch the ink on printed areas with wet or moist fingers after printing.
- Do not store printed media in the direct sunlight. Doing so might cause the media to become discolored.
- Store printed media in low-humidity locations.

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VI. ROUTINE MAINTENANCE BY THE USER

A. Head Cleaning

This printer is provided with a head cleaning function designed for maintaining image quality.

With bubble jet method, if air bubbles accumulate in the ink nozzles in the head or if ink dries in the ink nozzles, ink can no longer be discharged. This will result in white streaks appearing in images. If this happens, ask the user to restore the head by carrying out head cleaning on the control panel.

CAUTION

Thoroughly explain to the user that head cleaning consumes ink, and that it should be carried out only when image defects occur.

B. Replacing the Wiper Blade

If dirt or dust adheres to the wiper blade or ink accumulates on the wiper blade, wiping will not be carried out properly, resulting in defective or uneven ink discharge. If head cleaning does not solve image defects, replace the wiper blade. Follow the procedure below to replace the wiper blade.

CAUTION

As a guidelines, replace the wiper blade once every year.

1) Press the left or right arrow key in the offline mode or pause mode.
   - The carriage moves to the cartridge replacement position.
2) Lift up the dust cover.
3) Pull the wiper blade towards you holding it by its knob and lift up to remove.

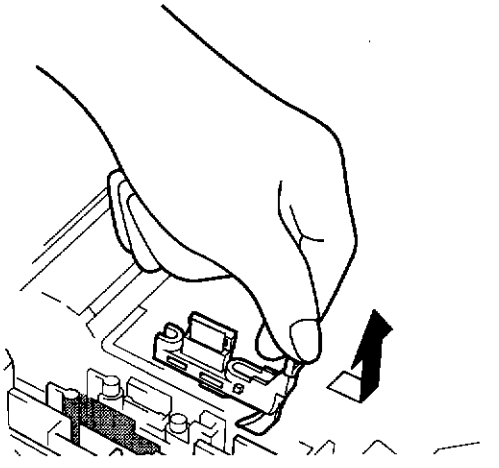

Figure 1-601

4) Install the new wiper blade.

CAUTION

Take care not to touch the blade.

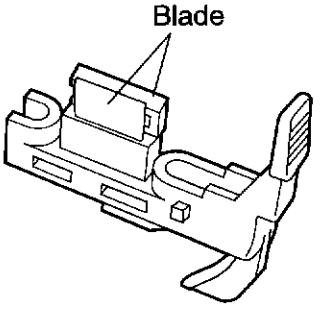

Figure 1-602

5) Lower the dust cover gently.
   - The carriage returns to its home position.

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C. Cleaning

Explain to the user that they should clean the following locations on the printer once every month or whenever necessary.

1) Platen
   Wipe off any media scraps or powder on the platen with a well-wrung moistened cloth, and wipe dry with a dry cloth.

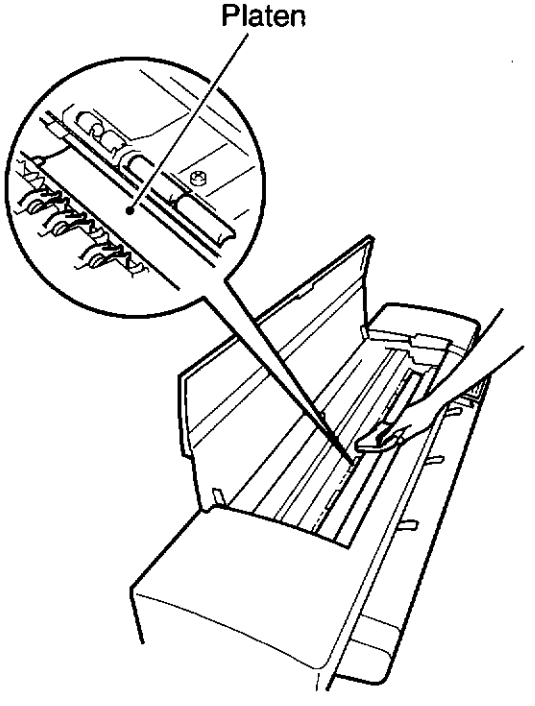

Figure 1-603

2) Roll media cover
   Wipe the cut sheet media loading surface with a well-wrung moistened cloth, and wipe dry with a dry cloth.

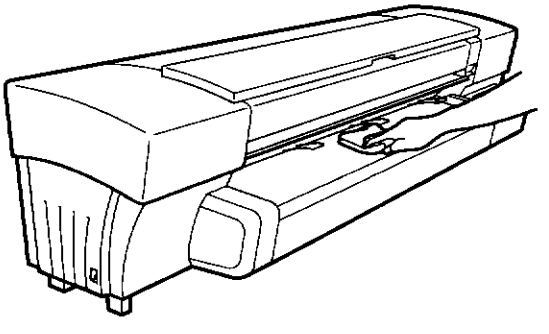

Figure 1-604

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VII. SITING CONSIDERATIONS

Do not site the printer at the following locations:

- Dirty, dusty locations
- Unstable flooring
- Floors that are not flat
- Floors that are not level
- Direct sunlight (Instruct the user to provide a curtain to shield the printer from direct sunlight if the printer must be sited in the direct sunlight.)
- Cold and dry, or hot and humid locations (recommended operating environment, temperature: 17.5 to 27.5°C, humidity: 25 to 75% (RH). Avoid siting the printer near water taps, hot water heaters, humidifiers, air conditioners, heaters and stoves.)
- Locations subject to sudden change in temperature or humidity
- Locations exposed to direct air current from an electric fan or air conditioner

Also, pay attention to the following, when siting the printer:

- When long media is in use, dirt or dust may be carried by the media when it touches the floor. Explain to the user that care should be taken to prevent media from touching the floor, and that the area around the printer should be kept clean at all times.
- Make sure that the feet on the stand firmly contact the floor.

Make sure that sufficient space as shown below is provided around the printer for maintenance.

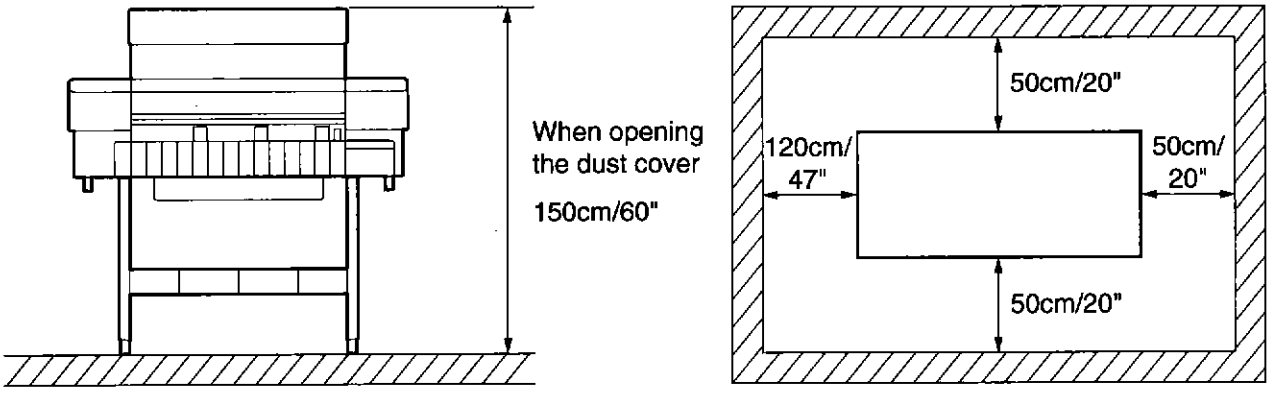

Figure 1-701

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VIII. TRANSPORTING THE PRINTER

How to move the machine to another location after it has been installed will involve one of two different circumstances.

In the first case the serviceman lifts the printer and moves it. in the second case the machine is moved using a track or transporting device.

The following are the procedures when moving the machine.

A. When the printer is lifted up and moved.

1) Press the ROLL/SHEET key and set the path change plate to "ROLL" mode position.

CAUTION
If the path change plate is in "CUT SHEET" the mode position , the feeder roller might be damaged. Always set the path change plate to "ROLL" mode position.

2) Press the left or right arrow key to move the carriage to the center of the platen.
3) Open the dust cover and remove the head joint from the cartridge. Then put the head joint on the joint stand.
4) Close the dust cover and turn the power off.
5) Remove the mounting screw and remove the tube cover.

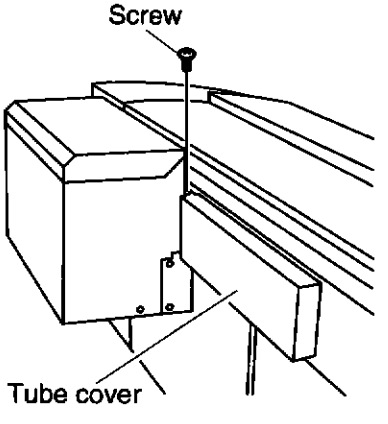

Figure 1-801

6) Remove the four ink supply tubes and the one connector.

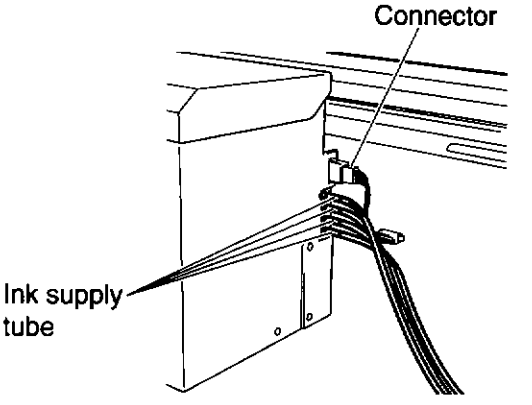

Figure 1-802

CAUTION
When removing the connector, make sure that the connector is the side of ink botlle case.
After the checking that the ink in the tube return to the buffer section, remove the ink supply tubes.

7) Insert the pin into the end of the removed ink supply tube.

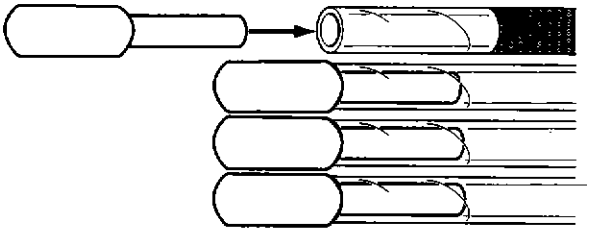

Figure 1-803

CAUTION
The pin might not be extractable if it is fully inserted into the tube.

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8) Attach the joint cap on the joint section of the ink bottle case.

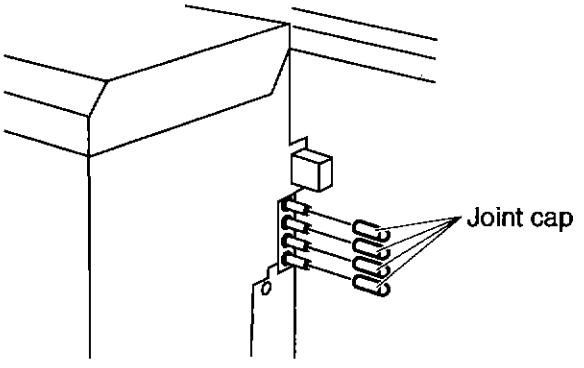

Figure 1-804

9) Remove the two mounting screws and remove the ink bottle case from the printer body.

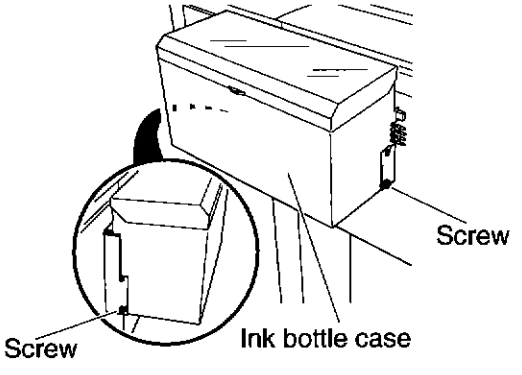

Figure 1-805

10) Fix the ink supply tubes on the rear of the printer using an ashesive tape.

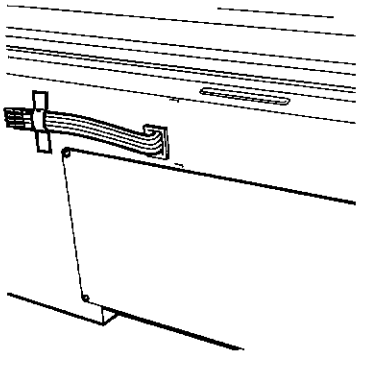

Figure 1-806

11) Install the tube cover using the reverse procedure of the procedure 5.
12) Separately carry the printer body and the ink bottle case to their destination.

CAUTION

When carrying the printer and the ink bottle case, don't tilt them because ink might flow out.

B. When the printer is moved using a track or transportation device.

1) Press the ROLL/SHEET key and set the path change plate to "ROLL" mode position.

CAUTION

If the path change plate is in "CUT SHEET" the mode position , the feeder roller might be damaged. Always set the path change plate to "ROLL" mode position.

2) Press the left or right arrow key to move the carriage to the center of the platen. Then turn the power off.
3) Remove the head joint from the cartridge. Then put the head joint on the joint stand.
4) Remove all the bubble jet cartridge.

CAUTION

Install new bubble jet cartridges whenever the printer is installed.

5) Fix the carriage using the carriage fixing plate which have been removed when the printer was installed.

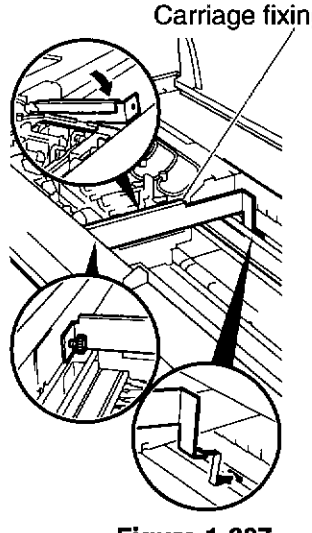

Figure 1-807

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6) Remove the mounting screw and remove the tube cover.

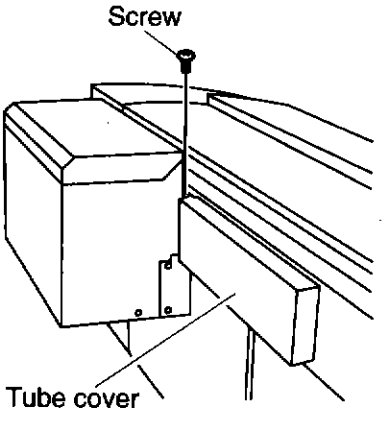

Figure 1-808

7) Remove the four ink supply tubes and the one connector.

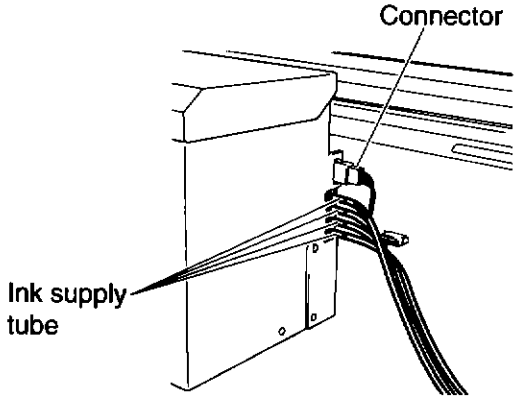

Figure 1-809

CAUTION
When removing the connector, make sure that the connector is the side of ink botlle case.
After the checking that the ink in the tube return to the buffer section, remove the ink supply tubes.

8) Insert the pin into the end of the removed supply tube.

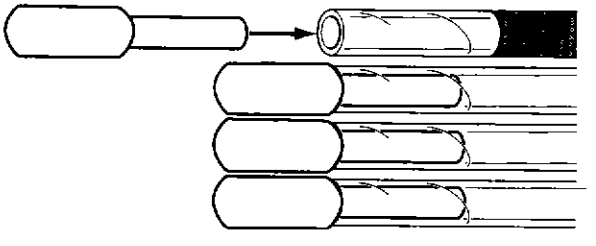

Figure 1-810

CAUTION
The pin might not be extractable if it is fully inserted into the tube.

9) Attach the joint cap on the joint section of the ink bottle case.

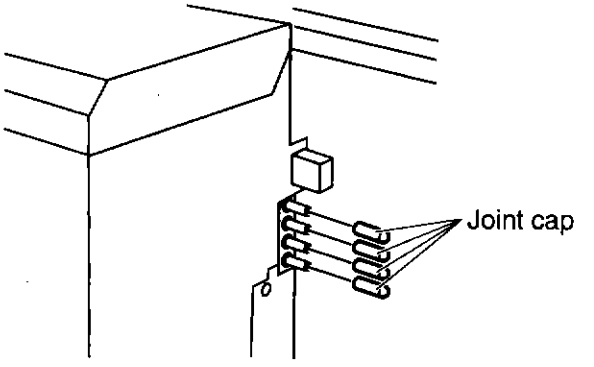

Figure 1-811

10) Remove the two mounting screws and remove the ink bottle case from the printer body.

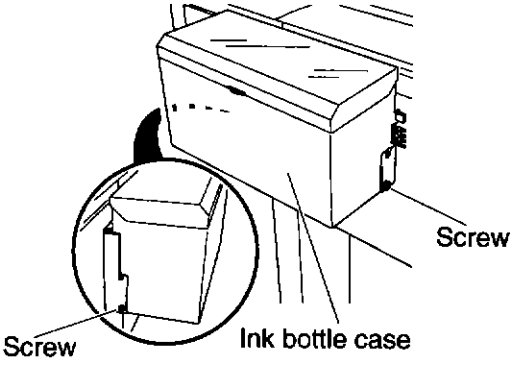

Figure 1-812

11) Remove the all ink botttles from the ink bottle case. Put a cap on each removed ink bottle.
12) Remove the four tube guides, using screw-driver.

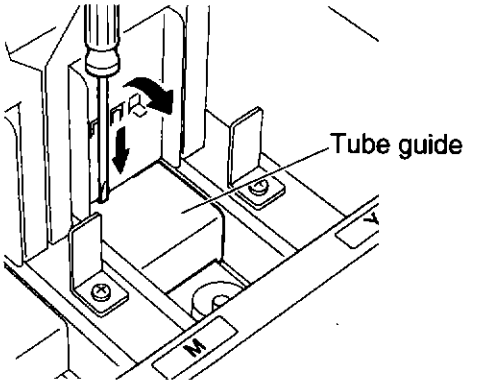

Figure 1-813

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13) Remove the four buffer electrodes using gloves in order to prevent ink stains.

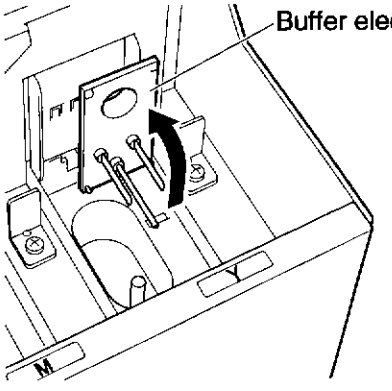

Figure 1-814

CAUTION
Before handling buffer electrode section, remove ink bottle case from printer body in order to prevent damage to ink detection PCB by static electricity.
Take the greatest care not to touch the metal part on the buffer electrode.

14) Attach the four buffer caps on the buffer section.

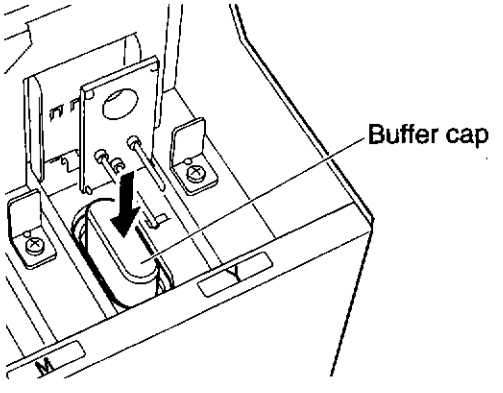

Figure 1-815

CAUTION
Before attaching buffer cap, check the amount of ink in buffer section.
If ink hides the rib in buffer section, remove the ink with syringe untill you see the rib.
When removing the ink, take care not to mix colors of ink in buffer section.

15) Fix the ink supply tubes on the rear of the printer using an ashesive tape.

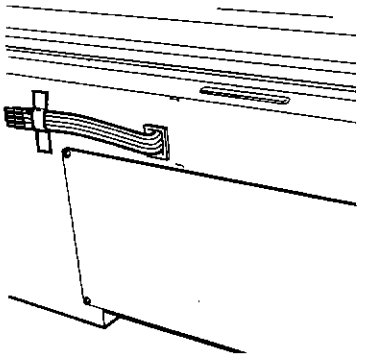

Figure 1-816

16) Fix the dust cover and roll media cover using an adhesive tape.
17) Remove the four screws fixing the printer, earch from right and left sides, and unload the printer body from the stand.

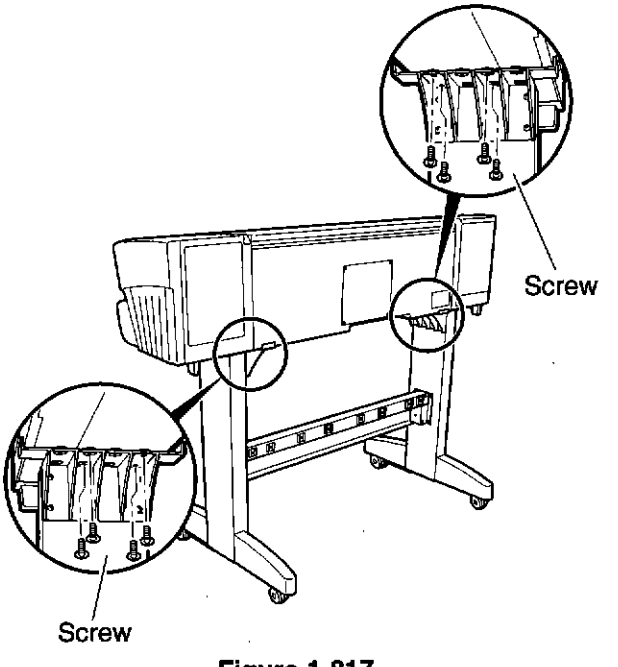

Figure 1-817

18) Demount the stand.
19) Separately transport the printer body, stand, ink bottle case, ink bottles, and tube cover after packing each of them.

CAUTION
When carrying the printer and the ink bottle case , don't tilt them because ink might flow out.

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I. BASIC OPERATION

A. Function Configuration

Broadly speaking, the functions of this printer are located in six blocks: image processor/controller, carriage, bubble jet cartridge, purge unit,Ink Bottle and transportation system.

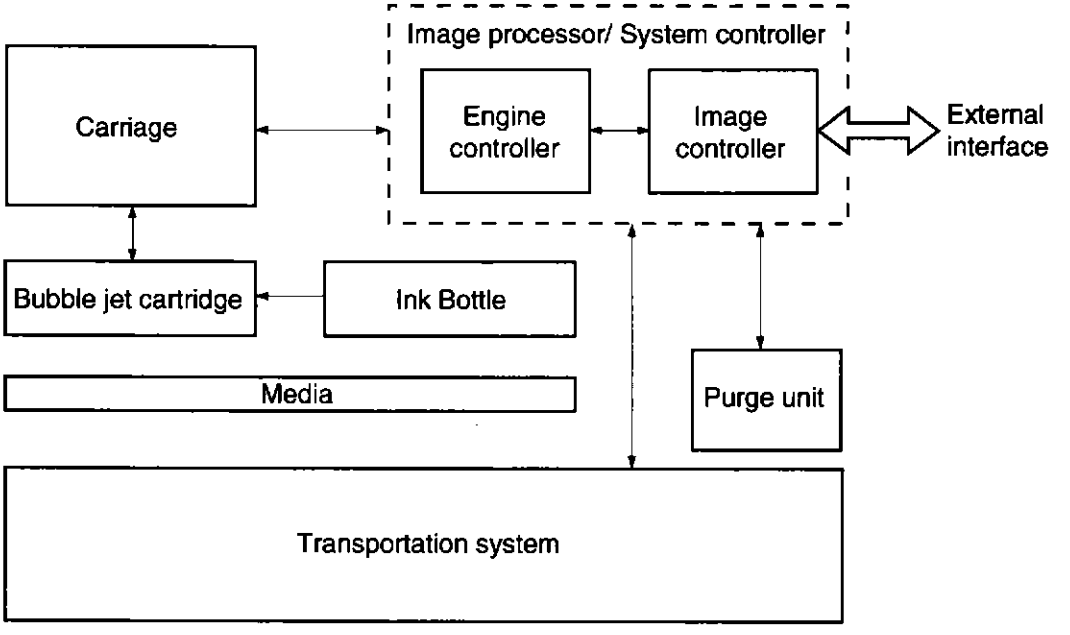

Figure 2-101

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B. Interface I/O

The following table shows the layout of the pin assignments of this printer interface.

Pin No.	Source	Compatible	Nibble	ECP
1	H	nStrobe	HostClk	HostClk
2	Bi-Di	Data 1 (Least Significant Bit)		
3	Bi-Di	Data 2		
4	Bi-Di	Data 3		
5	Bi-Di	Data 4		
6	Bi-Di	Data 5		
7	Bi-Di	Data 6		
8	Bi-Di	Data 7		
9	Bi-Di	Data 8 (Most Significant Bit)		
10	P	nAck	PtrClk	PeriphClk
11	P	Busy	PtrBusy	PeriphAck
12	P	PError	AckDataReq	nAckReverse
13	P	Select	Xflag	Xflag
14	H	nAutoFd	HostBusy	HostAck
15		Not defined		
16		Logic Gnd		
17		Chassis Gnd		
18	P	Peripheral Logic High		
19		Signal Ground (nStrobe)		
20		Signal Ground (Data 1)		
21		Signal Ground (Data 2)		
22		Signal Ground (Data 3)		
23		Signal Ground (Data 4)		
24		Signal Ground (Data 5)		
25		Signal Ground (Data 6)		
26		Signal Ground (Data 7)		
27		Signal Ground (Data 8)		
28		Signal Ground (PError, Select, nAck)		
29		Signal Ground (Busy, nFault)		
30		Signal Ground (nAutoFd, nSelectIn, nInit)		
31	H	nInit	nInit	nReverseRequest
32	P	nFault	nDataAvail	nPeriphRequest
33		Signal Ground		
34		Not defined		
35	P	Peripheral Logic High		
36	H	NSelectIn	IEEE1284 active	IEEE1284 active

Table 2-101

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C. Image Controller Control

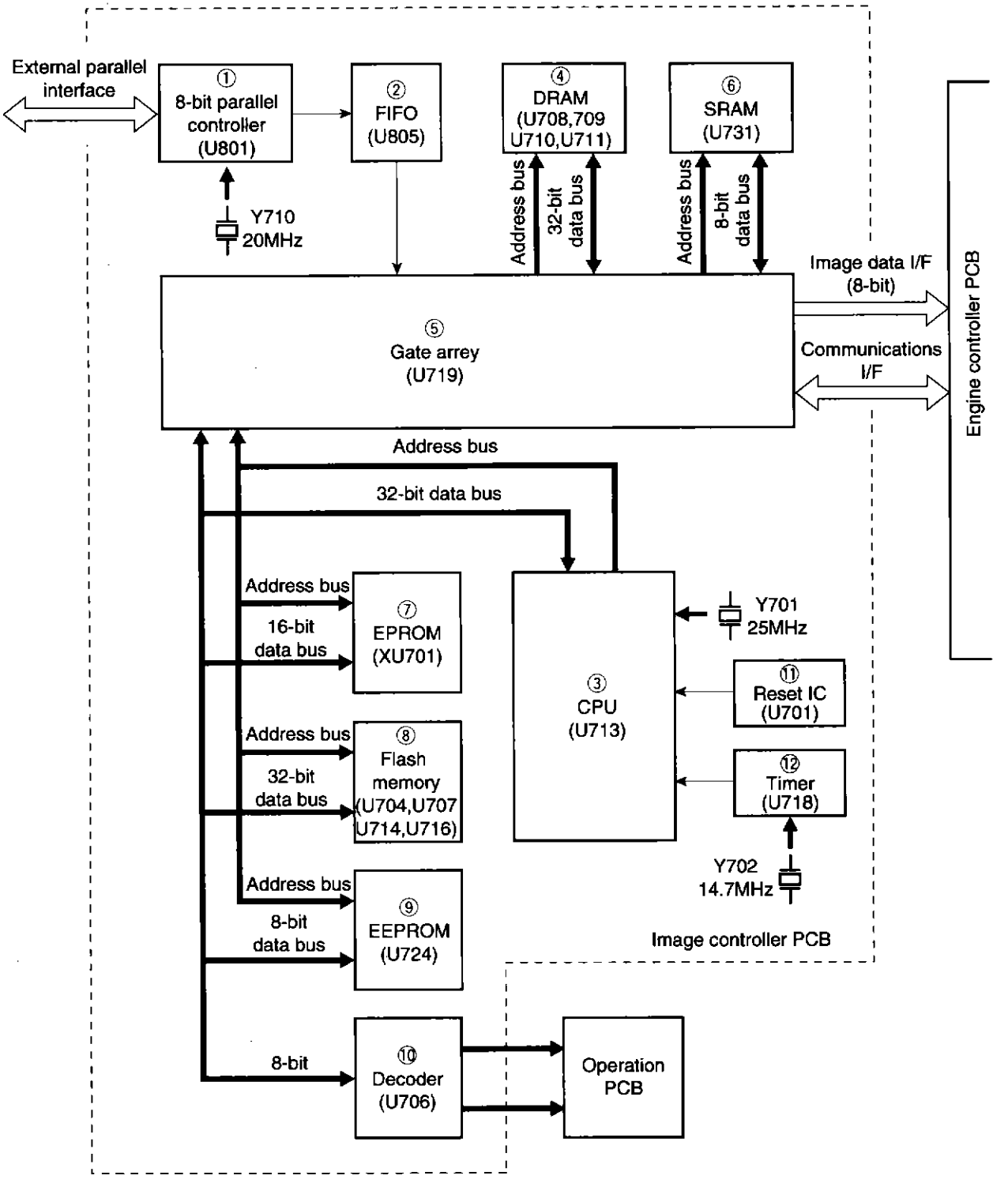

Figure 2-102

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① 8-bit parallel controller (U801)
Operates by the external 20 MHz clock. It supports various modes (compatible, nibble, ECP) as the latch timing for the image data from the computer.

② FIFO (U805)
This buffer temporarily stores the image data transferred between the 8-bit parallel controller and CPU.

③ CPU (U713)
The main functions of the CPU are as follows:
- Control of the image controller PCB
- Control of the 8-bit parallel controller
- Raster-raster conversion
- Communication with the engine controller PCB

④ DRAM (U708, U709, U710, U711)
Four 2 MByte RAMs connected by gate arrays on the 32-bit data bus. DRAM comprises the following memory areas:
- Temporary storage area for banding processing of KCMY bitmap data after conversion by CPU (U713)
- Work area for CPU system processing

⑤ Gate array (U719)
The main functions of the gate array are as follows:
- DRAM control
- Converts image data in DRAM that has been band-processed to swath data (raster-swath conversion) that is sliced into a width of a single discharge by the bubble jet cartridge.
- Address decodes
- 8-bit parallel output port for image data to the engine controller PCB

⑥ SRAM (U731)
This 32 kByte memory holds image data after raster-swath conversion until the transmission request is issued by the engine controller PCB.

⑦ EPROM (XU701)
This 1 MByte boot ROM is for initializing the CPU when the power is turned ON and starting up the program. It also holds the program to be downloaded.

⑧ Flash memory (U704, U707, U714, U716)
Four 512 kByte ROMs hold the program for the image controller PCB. Its main functions are as follows:
- Interface parsing
- Operation panel control
- Generation of adjustment test patterns

⑨ EEPROM (U724)
This 32 kByte ROM that holds printer information and values set up on the control panel.

⑩ Decoder (U706)
This decoder interfaces the CPU (U713) and the control panel I/O ports.

⑪ Reset IC (U701)
This IC resets the CPU (U713) when the power is turned ON.

⑫ Timer (U718)
Operates the 14.7 MHz external clock after 1/2 division. The main timer functions are as follows:
- DRAM refresh timing
- Time used on the communication with the engine controller PCB
- Time used by system operations on the image controller PCB

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D. Engine Controller Control

1. Engine Controller Control

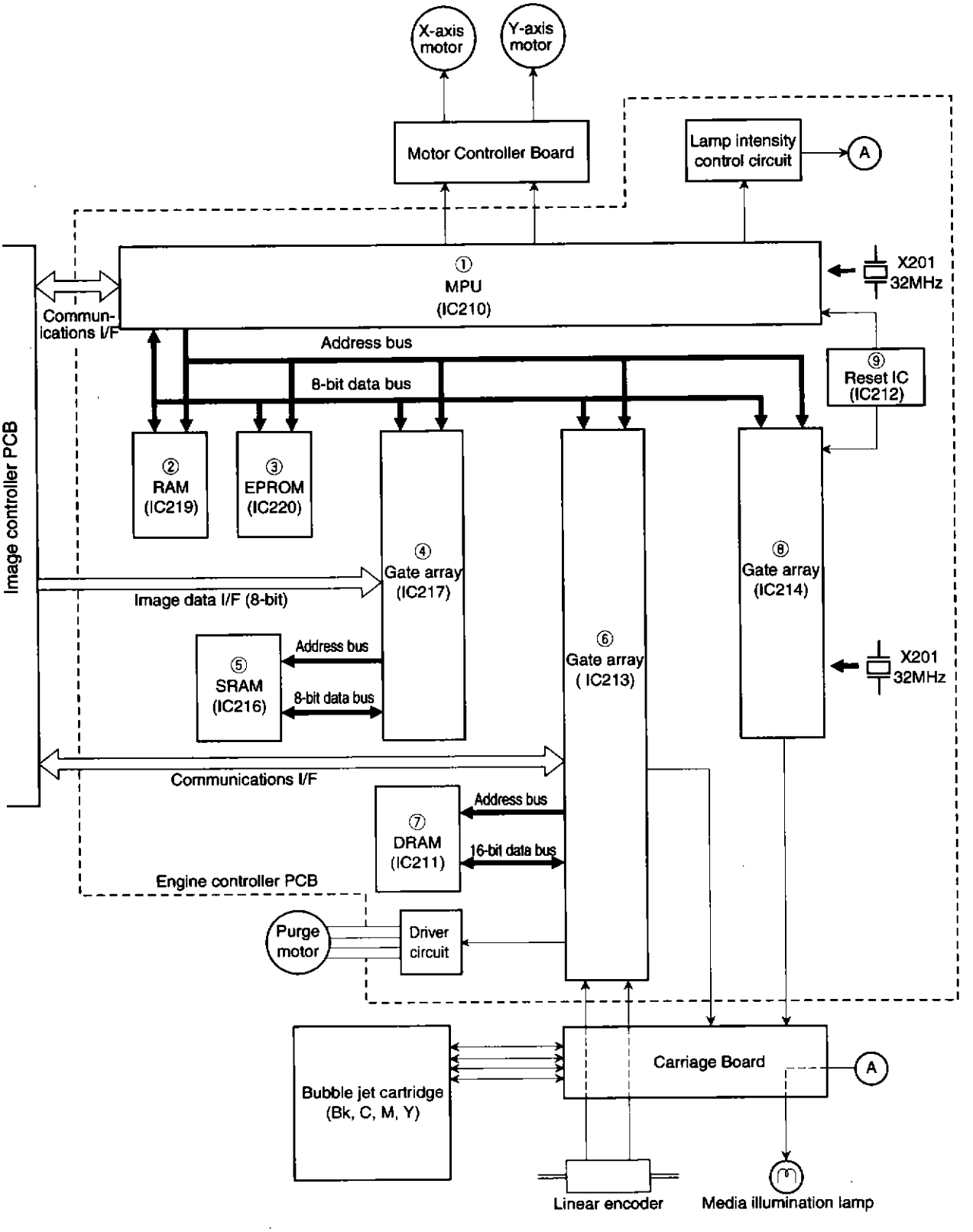

Figure 2-103

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① MPU (IC210)
The MPU is connected to RAM, EPROM and gate arrays (IC213, IC214, IC217) by a 20-bit address bus and 8-bit data bus. A 32 MHz external clock is divided internally to 16 MHz for internal operations. The main functions of the MPU are as follows:
- Communications with image controller PCB
- Control of X-axis and Y-axis motors
- Sensors and switches input ports
- Solenoids output ports
- Serial communications with slave CPU on carriage board
- Lamp lighting signal output of media sensor

② RAM (IC219)
32 kByte RAM is assigned as work area for system processing of the MPU. RAM is provided with a built-in battery and clock, and holds the following data:
- Control panel setups and adjustment value setups
- Pre-discharge and suction count (waste ink fill detection)

③ EPROM (IC220)
- Program memory
- Internal pattern for auto head adjustment backup

④ Gate array (IC217)
This gate array is provided with an 8-bit parallel image data input port from the image controller, and is for carrying out image data conversion. It is connected to SRAM (IC216) by a 9-bit address bus and 8-bit data bus, and controls SRAM read/write operations.

⑤ SRAM (IC216)
8 kByte SRAM is connected to gate array (IC217) by an 8-bit bus, and is assigned as work area for image data conversion.

⑥ Gate array (IC213)
This gate array counts pulses output from the linear encoder, and generates the operation timing of the three gate arrays (IC213, IC214, IC217) matched to the output signals of the linear encoder. The main function of this gate array are as follows:
- Output of the purge motor drive signals
- Sensors and switches input ports

⑦ DRAM (IC211)
4 MBit DRAM saves image data loaded to gate array (IC213).
Generates head drive pulses.

⑧ Gate array (IC214)
This gate array operates by an external 32 MHz clock. This clock is divided to 16 MHz and fed to gate arrays (IC213 and IC217).
Generates head drive pulses.

⑨ Reset IC (IC212)
The reset IC applies a reset to the MPU (IC210) and gate arrays (IC213, IC214 and IC217) synchronized with power ON.

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2. Engine Controller I/O (1/4)

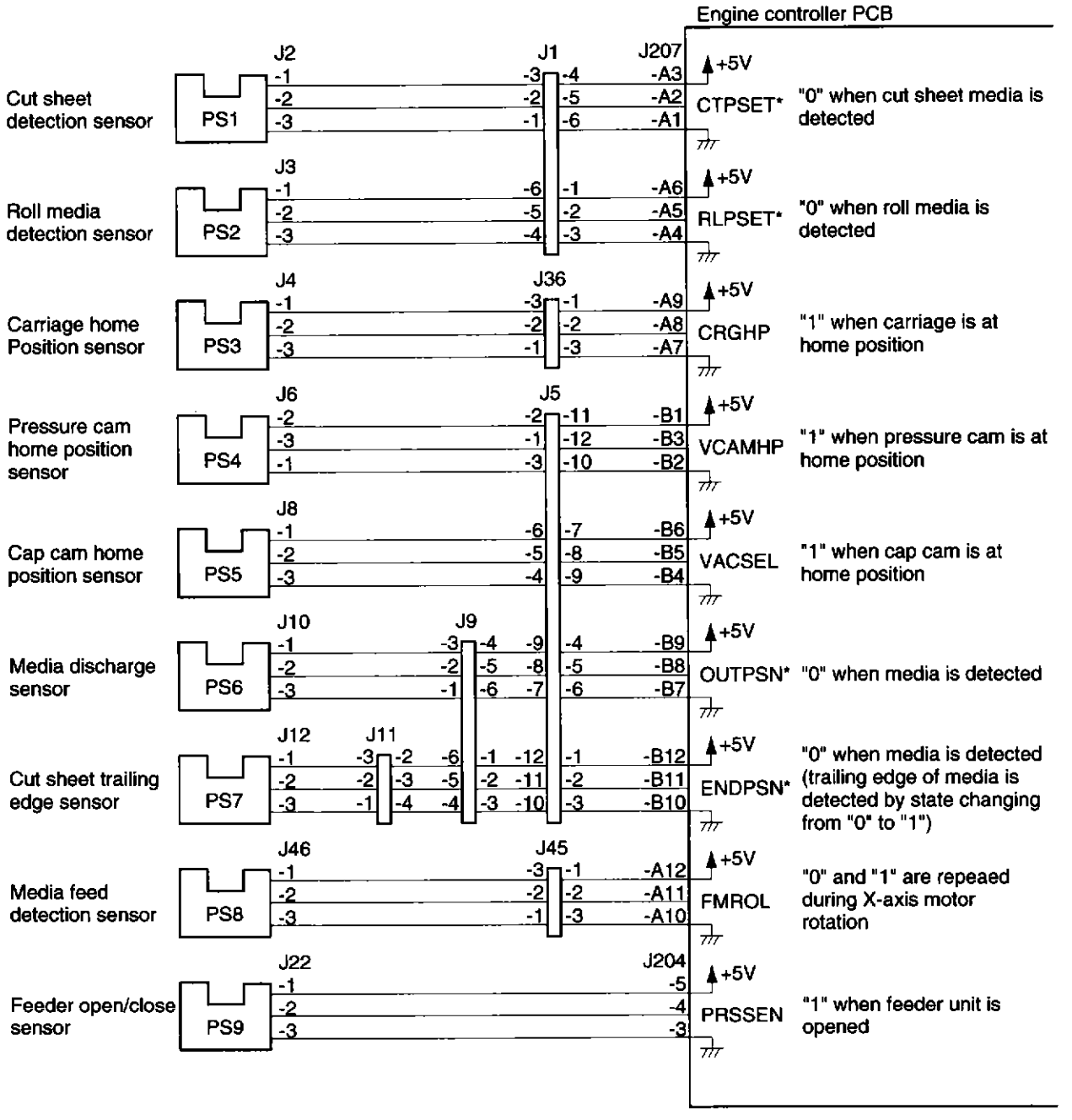

Figure 2-104

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3. Engine Controller I/O (2/4)

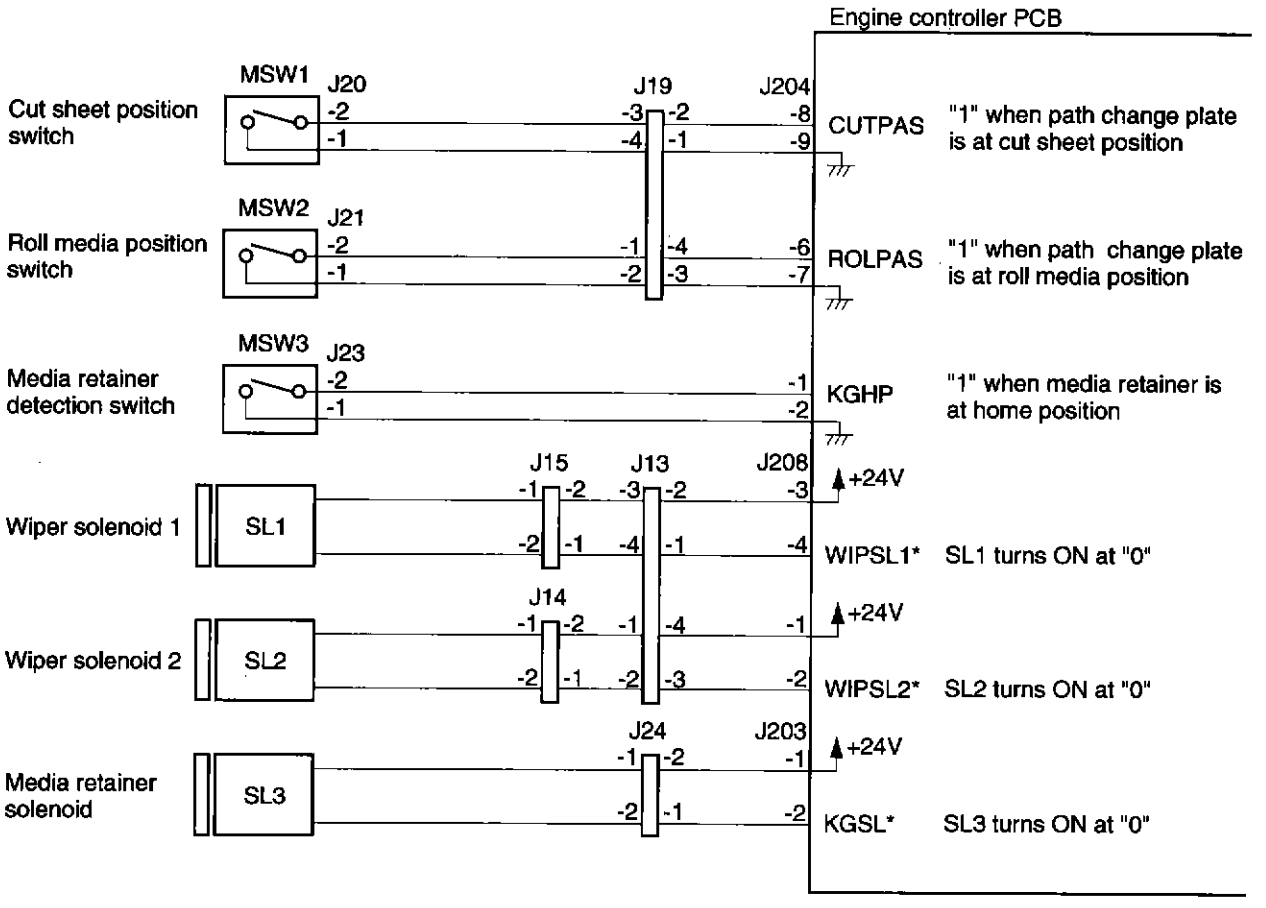

Figure 2-105

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4. Engine Controller I/O (3/4)

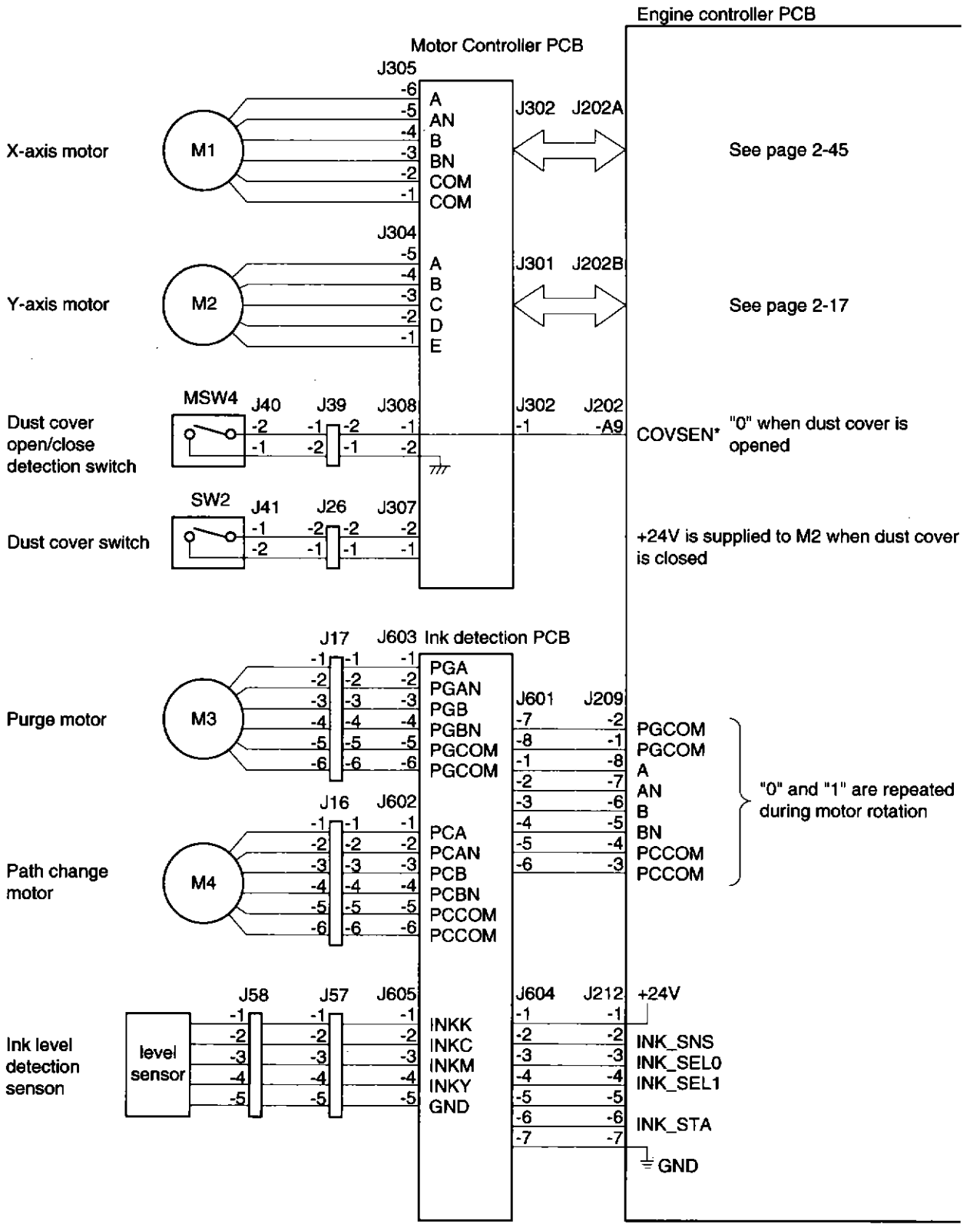

Figure 2-106

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5. Engine Controller I/O (4/4)

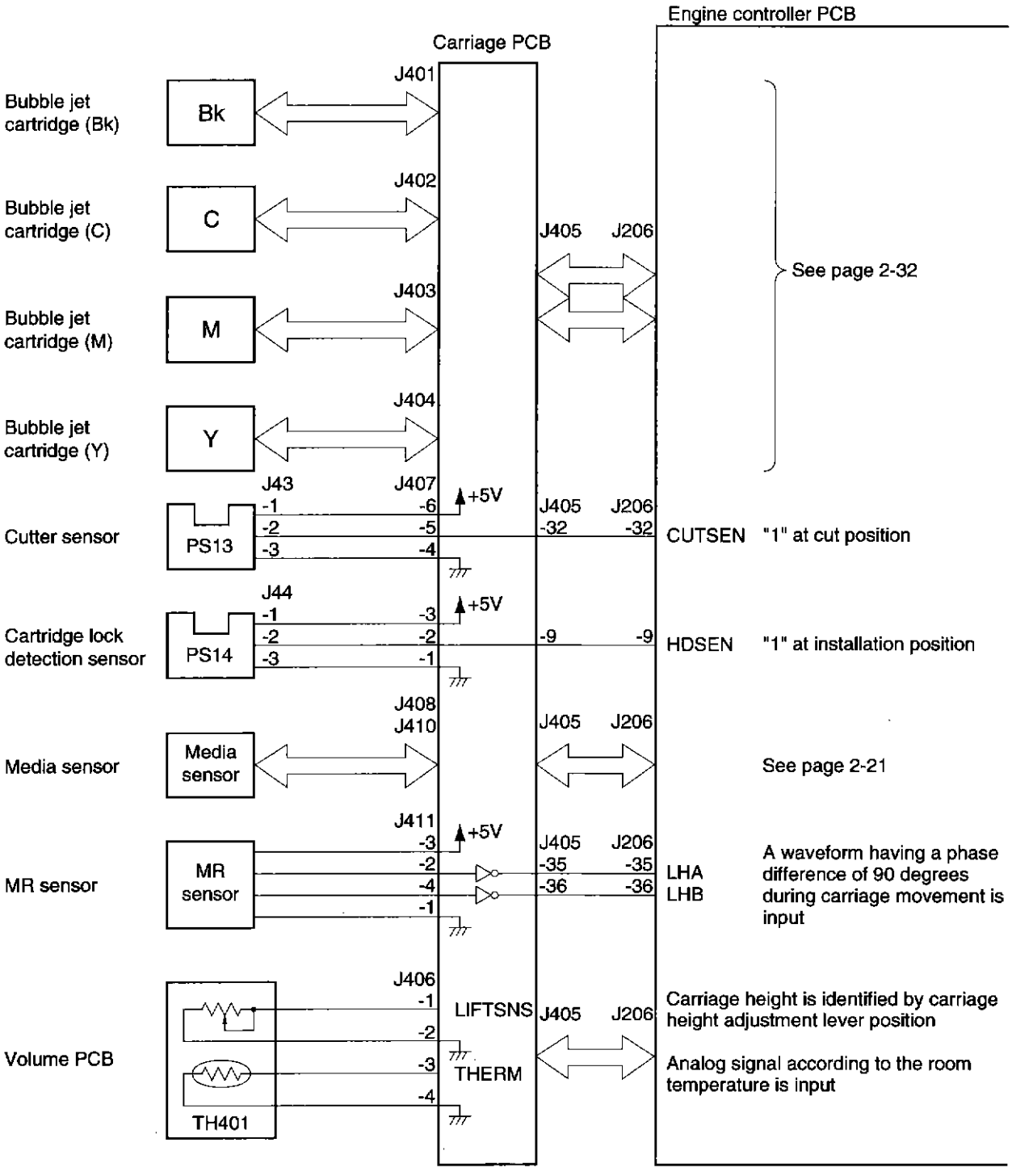

Figure 2-107

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E. Outline of Operation

1. Power Switch is Turned ON

When the power switch is turned ON, the printer rotates the purge motor (M3) to decap the head. Rotation of the Y-axis motor (M2) operates the carriage to detect the carriage home position and simultaneously detect cap cam home position.

Wiping and capping operation is then carried out on the parge unit, and the printer is set to the media load standby state.

If roll media is already located on the platen, the media width and skewed feed are detected. Also, if the printer is not used for 72 hours or more, head cleaning is carried out.

2. When Media is Loaded

When media is loaded, the printer starts feeding media to the print standby position.

If cut sheet media is loaded, the carriage moves to the left end of the platen to draw out the media retainer. Media width, skew and length are then detected by the media sensor installed on the carriage.

If roll media is loaded, the leading edge of the media is trimmed and cut by the Y cutter after media width and skew detection has ended.

3. In the Online Mode

When file data is transferred from the computer in the online mode, the printer advances and retracts the carriage alternately with media feed to discharge ink onto the media.

During printing, head drive is controlled for discharging the optimum amount of ink.

When printing of a sheet of media ends, the media is discharged from the media exit.

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F. Multi-pass Print

1. Outline

This printer is provided with a 3-pass and 5-pass multi-pass print modes for reducing the incidence of stripes appearing between bands in the printed image.

Multi-pass print is determined by a combination of the following conditions, and changes the media feed amount and ink discharge distribution.

① Print mode selected on the control panel (image definition/print speed selection)
② Type of media in use (image definition selection)
③ Color mode or monochrome mode (bubble jet cartridge selection)

Table 2-102 shows the relationship between conditions and multi-pass printing.

Cartridge	Media Type	Print Mode		
		DRAFT	NORMAL	ENHANCED
Monochrome Mode	Plain Paper	1-pass bi-direction	1-pass uni-direction	3-pass uni-direction
	Coated Paper	1-pass bi-direction	1-pass uni-direction	5-pass uni-direction
	GA Paper/Film	1-pass bi-direction	1-pass uni-direction	5-pass uni-direction
Color Mode	Plain Paper	1-pass uni-direction	1-pass uni-direction	3-pass uni-direction/black-enhanced
	Coated Paper	1-pass uni-direction	1-pass uni-direction	3-pass uni-direction/black-enhanced
	GA Paper/Film	1-pass uni-direction	1-pass uni-direction	5-pass uni-direction/black-enhanced

Table 2-102

Reference

Increasing the number of passes makes non-discharge of ink less conspicuous.

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2. Operation

The following describes multi-pass print in the 3-pass print mode.

Reference

Though the bubble jet cartridges used on this printer are configured to have 128 nozzles, 120 nozzles are actually used during printing.

1) A band of about 2.8 mm in width is printed by 1/3 of the innermost nozzles when the carriage moves backwards.

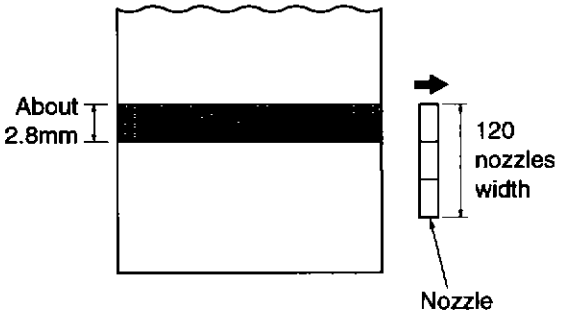

Figure 2-108

2) The media is fed about 2.8 mm, and the carriage moves forward to the left edge of the media.

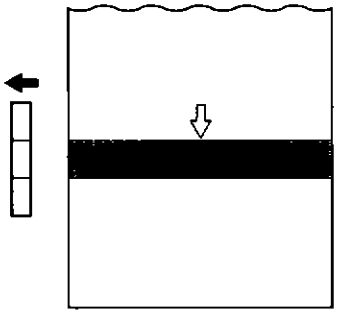

Figure 2-109

3) A band of about 5.6 mm in width is printed by 2/3 of the innermost nozzles when the carriage moves backwards.

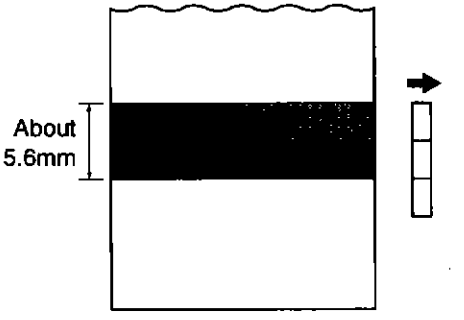

Figure 2-110

4) The media is fed about 2.8 mm, and the carriage moves forward to the left edge of the media.

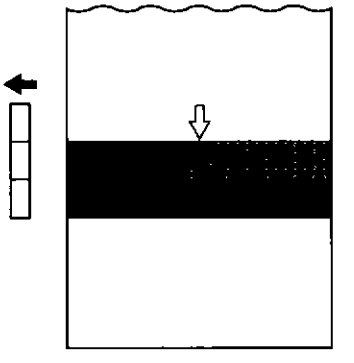

Figure 2-111

5) A band of about 8.4 mm in width is printed by all of the nozzles when the carriage moves backwards.

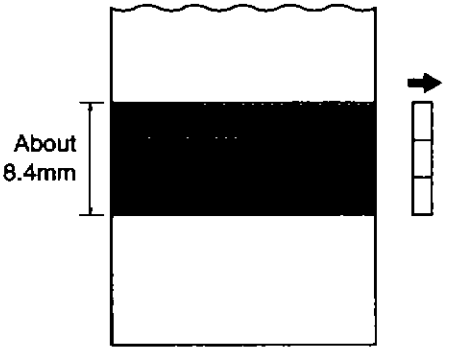

Figure 2-112

6) Steps 4) and 5) are repeated to print the entire image.

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Reference

In the 3-pass print mode, ink is discharged divided over three passes.

3. Black-enhanced

The ENHANCED mode is provided with a high-definition color print mode that outputs enhanced monochrome prints.

In the black-enhanced mode, black is enhanced during multi-pass printing by discharging ink again over discharged Bk ink dots in subsequent passes.

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II. CARRIAGE

A. Outline

Figure 2-201 shows the carriage and the configuration of its drive components.

The carriage advances/retracts along the media driven by the Y-axis motor (M2) via the carriage drive belt. The distance that the carriage moves is controlled by the number of signal pulses fed to the motor controller PCB from the engine controller PCB.

Print signals from the engine controller PCB are transferred to the bubble jet head mounted on the carriage via the carriage PCB.

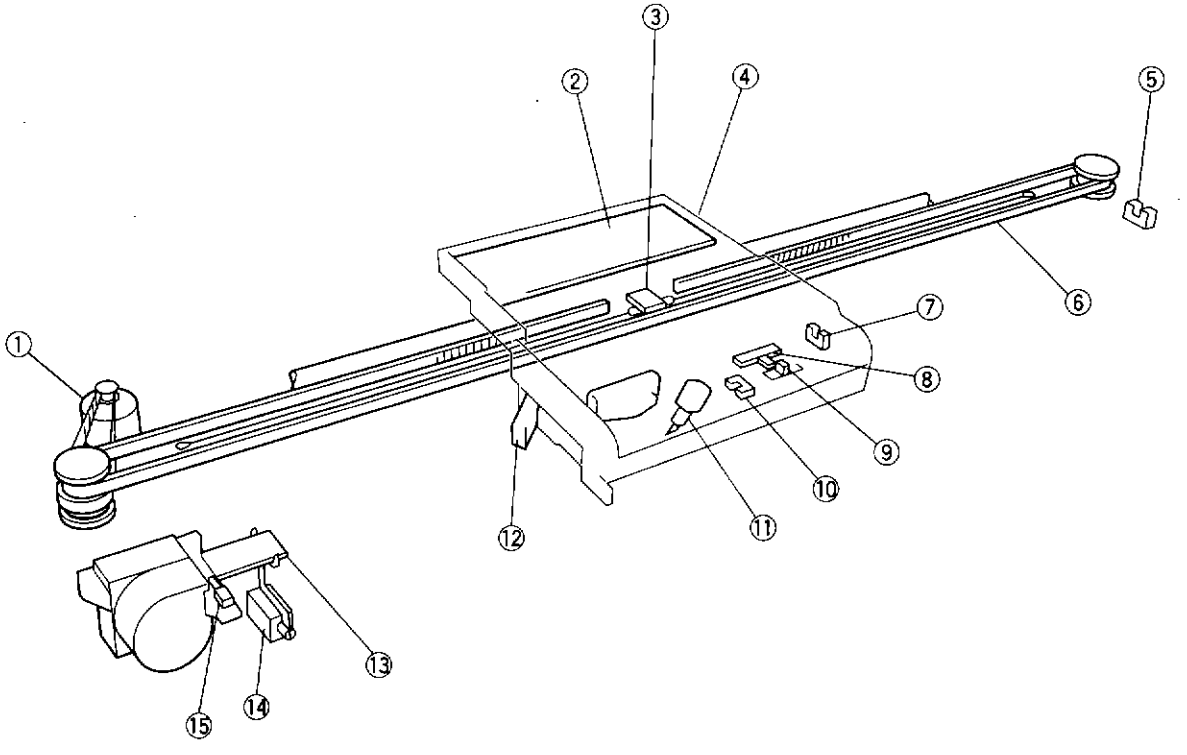

Figure 2-201

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No.	Name	Function
①	Y-axis motor (M2)	Advances/retracts the carriage.
②	Carriage PCB	Relays the print signals output from the engine controller to the bubble jet head. It also communicates serially with the engine controller according to a 4-bit slave CPU, and sends room temperature, head temperature and head rank information to the engine controller.
③	Linear encoder	Generates rectangular wave pulses according to carriage movement.
④	Carriage	The carriage houses four-color bubble jet cartridges, and is advanced/ retracted along the platen by Y-axis motor (M2) drive.
⑤	Carriage home position sensor (PS3)	Detects the carriage home position.
⑥	Carriage drive belt	Transfers Y-axis motor (M2) drive to the carriage.
⑦	Cartridge lock detection sensor(PS14)	Detects the state of the cartridge fixing knob.
⑧	Volume PCB	Slides by moving the cartridge height adjustment lever, and changes the discharge timing of the ink matched to the cartridge height. A thermistor for detecting room temperature is mounted on this PCB.
⑨	Cartridge height adjustment lever	Changes the distance between the head and platen in three stages.
⑩	Cutter sensor (PS13)	Detects Y cutter errors.
⑪	Y cutter	Rises/lowers by carriage movement to cut roll media.
⑫	Media sensor	Detects the edges of the media and the ink dot positions at resist adjustment.
⑬	Media retainer	This is drawn to the platen by the carriage during media feed to prevent the media from rising up from the platen.
⑭	Media retainer solenoid (SL3)	Hooks the media retainer onto the carriage.
⑮	Media retainer detection switch (MSW3)	Detects whether or not the media retainer is drawn out.

Table 2-201

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B. Y-axis Motor Control

1. Outline

The Y-axis motor (M2) is a 5-phase controlled stepping motor.

5-bit parallel signals CMSELES and CMSEL0 to 3 output from the engine controller are converted to combinations of 5-phase motor drive pulses (A, B, C, D, E) by the motor driver. Controlling the drive pulses by these CMSELES and CMSEL0 to 3 signals switches the rotation direction, rotation speed, and ON/OFF switching of the Y-axis motor.

Figure 2-202 is a block diagram showing the control circuits of the Y-axis motor.

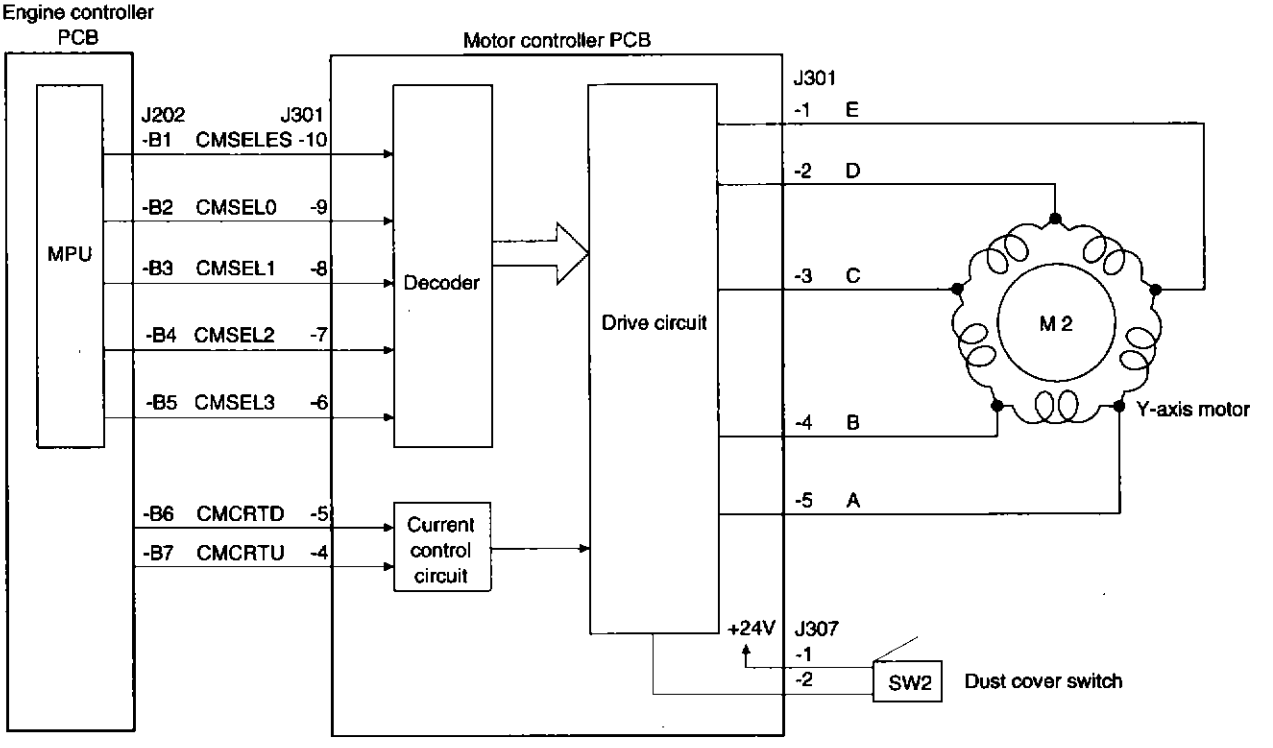

Figure 2-202

2. ON/OFF Control

Stopping output of CMSEL signal stop the motor drive pulses from the motor driver to stop the Y-axis motor.

3. Rotation Direction Control

Changing the order in which the CMSELES and CMSEL0 to 3 combinations of signals are output changes the output order of the motor drive pulses to switch the direction of rotation of the Y-axis motor.

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4. Rotation Speed Control

Changing the frequencies of the output pulses of the CMSELES and CMSEL0 to 3 combinations of signals controls the rotation speed of the Y-axis motor.

5. Motor Supply Current Control

The supply current is controlled by the combination of CMCRTD and CMCRTU according to the rotating state of the Y-axis motor to ensure smooth motor rotation and suppress generation of heat.

	Acceleration	Fixed Speed	Stop
CMCRTD	1	1	0
CMCRTU	0	1	0

Table 2-202

6. Dust Cover Open/Close Detection

A dust cover switch (SW2) is provided as a safety interlock when the dust cover is opened during carriage operation.

When the dust cover is opened, the dust cover switch turned OFF, and the drive voltage (+24 V) for the Y-axis motor (M2) is cut to stop the Y-axis motor.

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C. Linear Encoder

1. Outline

This printer is equipped with a linear encoder for checking the operating status of the carriage and aligning the position of ink discharging on the media.

2. Structure

Figure 2-203 shows the configuration of the linear encoder.

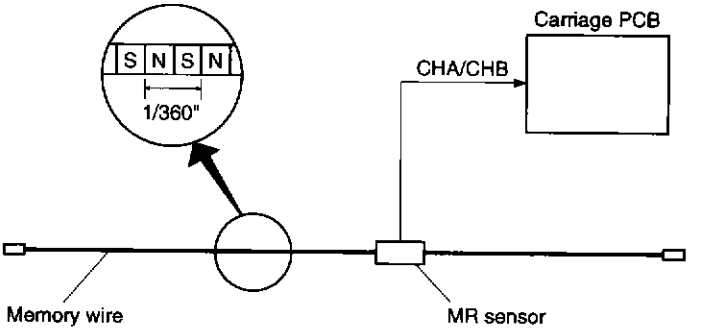

Figure 2-203

① Memory wire

This is a magnetic wire on which a magnetized pattern is printed at 1/360" intervals.

② MR sensor

This sensor reads the magnetized pattern on the memory wire, and outputs a 2-phase rectangular wave.

3. Output Signal

The two rectangular waves (LHA, LHB) having a phase difference of 90° as shown in Figure 2-204 are output to the gate arrays on the engine controller PCB from the MR sensor via the carriage PCB.

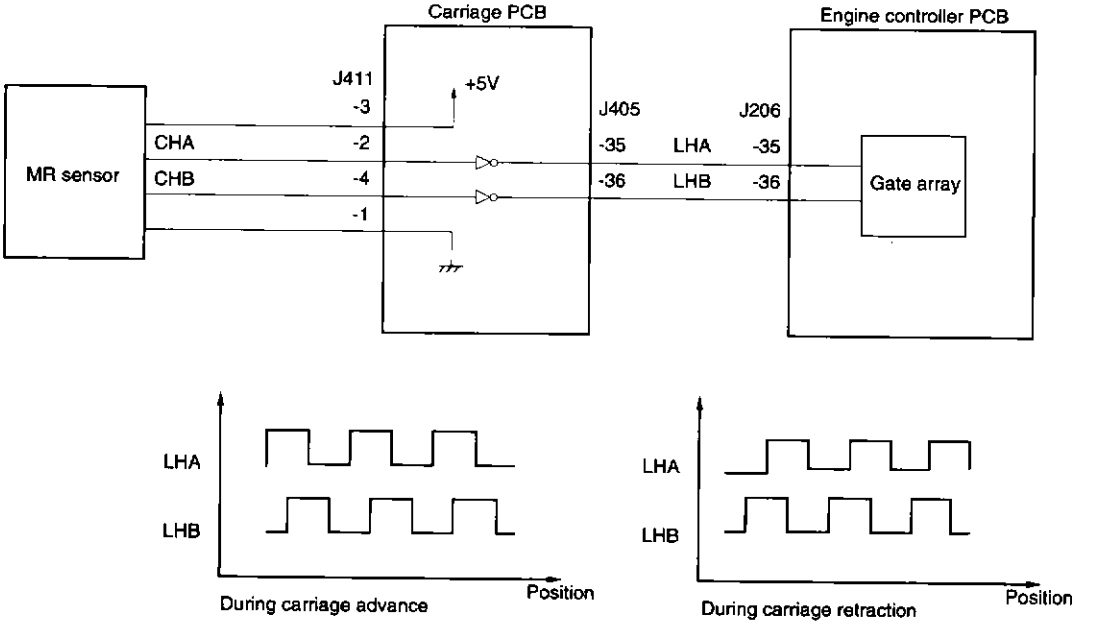

Figure 2-204

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4. Control

The engine controller carries out the following control and confirmation operations from input LHA and LHB signals:

- Ink discharge timing control
- Confirmation of carriage operation
- Confirmation of carriage position

a. Ink discharge timing

The ink dot position on the media is aligned by the engine controller generating the LTCLK signal synchronized with the rise of the LHA pulse during carriage advance and the fall of the LHB pulse during carriage retraction.

b. Carriage operation

The LHA signal is input to the engine controller at a phase difference of 90° to the LHB signal during carriage advance and at a phase difference of -90° during carriage retraction. This allows the engine controller to confirm carriage operating status and direction of movement.

c. Carriage position

The carriage position is confirmed by counting the number of pulses at the rise of the LHA pulse during carriage advance and the fall of the LHA pulse during carriage retraction.

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D. Media Sensor

1. Outline

Media sensor is installed on the carriage mainly for detecting the media width, skew feed, and for auto head adjustment. Media sensor comprises a media illumination lamp and two reflection-type photosensors. The illumination of the media illumination lamp can be adjusted in two stages, and the intensity is raised to improve sensitivity during resist adjustment.

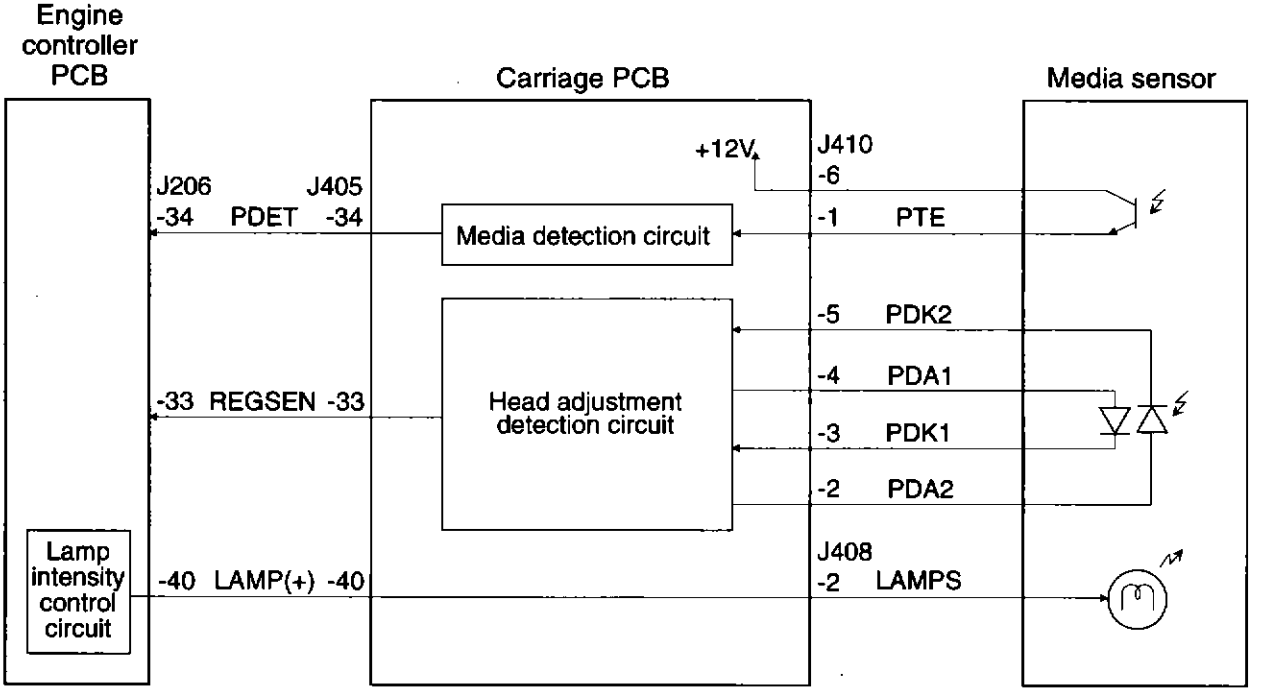

Figure 2-205

2. Media Width Detection

The carriage is moved with the media illumination lamp of media sensor lit during media feed to detect the left and right edges of the media. During carriage movement, the output pulses of the linear encoder from the time that the carriage leaves the home position up to when the edges of the media are counted. The media width is determined from the average count values during advance and retraction.

The following media width values are regarded as outside of the specification, and an error code [5E] is displayed on the control panel:

Media width is less than 195.0mm
Media width is greater than 929.4mm

On the other hand, when the right edge of the media that is detected during media width detection is 7 mm or more away from the media guide, error code [5F] is displayed.

This is to prevent the print area from coming outside of the platen area when media is loaded at a position that has shifted excessively to the left when media of the maximum size (36" width) is in use.

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3. Skewed Feed Detection

Media skew is detected by detecting the position of the right edge of the media after the media has been fed by a fixed distance with respect to a position on the right of the media detected by media width detection.

To determine the position of the right edge of the media, the average number of pulses during advance and retraction output from the linear encoder after the carriage leaves its home position up to when the right edge of the media is detected.

① Roll media

Skew detection is carried out after feeding the media 300 mm after media width detection.

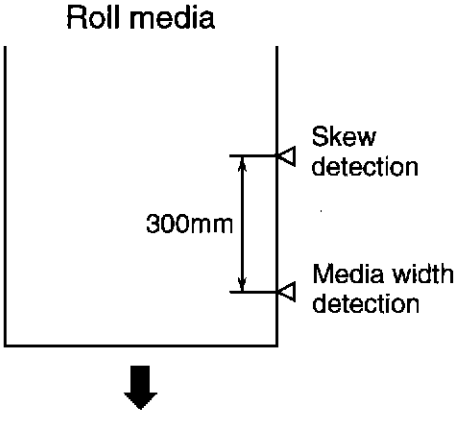

Figure 2-206

② Cut sheet media

The 1st skew detection is carried out after feeding the media 300 mm after media width detection. The media is then fed further, and the 2nd skew detection is carried out when the trailing edge of the media has passed beyond the cut sheet trailing edge sensor (PS7).

If the trailing edge has passed beyond the cut sheet trailing edge sensor (PS7) before the media is fed 300 mm, skew detection is carried out at that position.

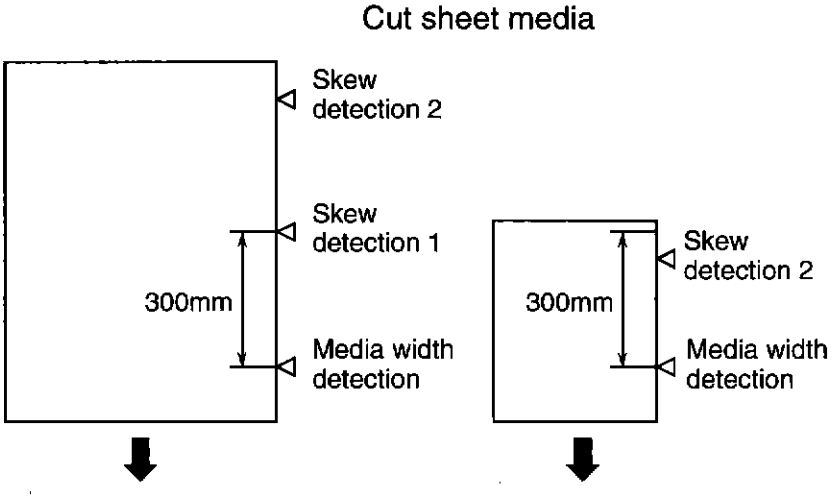

Figure 2-207

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Media skew is judged according to the skew tolerances shown in the following table after skew detection is carried out. In this table, skew is calculated by dividing the amount of shift at the right edge of the media by the media feed amount.

Media	Skew
Roll media	0.15% or more
Cut sheet media (media fed 300 mm or more)	0.27% or more
Cut sheet media (media fed less than 300 mm)	2% or more

Table 2-203

When media skew is detected, the printer carries out the operations indicated in Table 2-204.

Media Type/Timing	Operation
• Roll media • Cut sheet media whose media feed is 300 mm or more (when skew is detected by skew detection 1)	Media feed is stopped.
• Cut sheet media whose media feed is less than 300 mm • Cut sheet media whose media feed is 300 mm or more (when skew is detected by skew detection 2)	The media is discharged.

Table 2-204

4. Auto Head Adjustment

The nozzle positions on each of the cartridges sometimes shift depending on the cartridge installation state, causing the positions where ink is discharged onto the media to shift. Auto head adjustment automatically corrects this shift.

Two head adjustments are provided: vertical head adjustment where shift is corrected in the X-axis direction, and horizontal head adjustment where shift is corrected in the Y-axis direction. These head adjustments are carried out in the following step.

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a) Non-discharge detection

When auto head adjustment is selected on the control panel with A3/11"×17" size media portrait or longer loaded on the printer, a non-discharge detection pattern is printed. The media sensor reads this pattern to check non-discharge of the nozzles used in the head adjustment. If non-discharge is detected, suction operation is carried out to restore the head. If non-discharges are detected continuously three times even after suction is carried out, error code [89] is displayed.

b) Vertical head adjustment (adjustment in X-axis direction)

When non-discharge detection has ended, a line pattern is printed in the Y-axis (horizontal) direction. The distance to the line printed during advance and retraction of each color is measured by the media sensor referenced against the black line printed during advance to determine the offset value.

c) Horizontal head adjustment (adjustment in Y-axis direction)

Next, a line pattern in the X-axis (vertical) direction. The distance to the line printed during advance and retraction of each color is measured by the media sensor referenced against the black line printed during advance to determine the offset value.

CAUTION

The head adjustment must be carried out after the cartridge fixing knob has been turned to release the cartridge.

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E. Media Retainer

1. Outline

The media retainer prevents the leading edge of media from rising up from the spur unit when feeding curled media face up.

2. Operation

When feeding media, the printer temporarily stops media feed, and the carriage is advanced to the media retainer on the left of the platen.

When the media retainer solenoid (SL3) turns ON, the media retainer is hooked onto the carriage which retracts with the media retainer drawn out. Media feed is then resumed.

When media feed ends, the carriage advances to the left of the platen to release the media retainer.

If something prevents the media retainer from being hooked, this is detected by the media retainer detection switch (MSW3), and an error code [54] is displayed on the control panel.

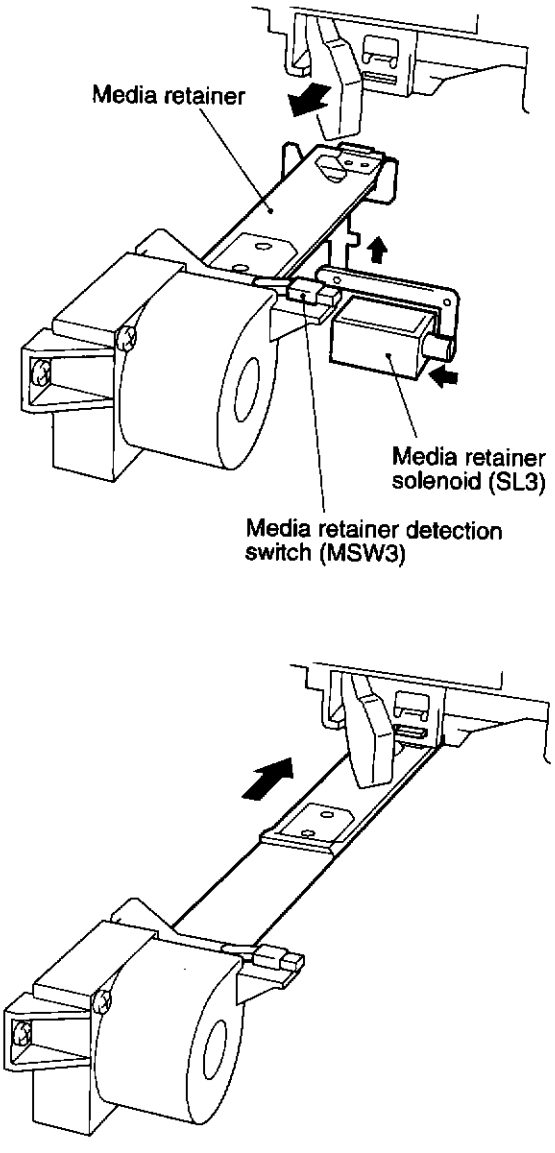

Figure 2-208

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F. Y Cutter

1. Outline

The Y cutter is installed on the carriage. This cutter is lowered by carriage movement to cut roll media, and is designed to rise up automatically if cutting is defective, for example, when cutting heavy media.

Reference

Roll media is cut in the following instances:

- Roll media is cut 80 mm to cut the leading edge of new media straight at right angles after it has been fed.
- The trailing edge of roll media is cut after it has been printed.
- Roll media is cut when the CUT key on the control panel is pressed.
- Roll media is cut 150 mm to remove wrinkles if it has not been used for 12 hours or more when the power switch is turned ON.

2. Cut Operation

When cutting roll media, the carriage advances to the left of the platen. Here, the cutter is lowered along the cutter guide on the left of the guide rail.

The carriage continues to retract to cut the roll media, and the cutter is raised at the hole at the right side of the guide rail.

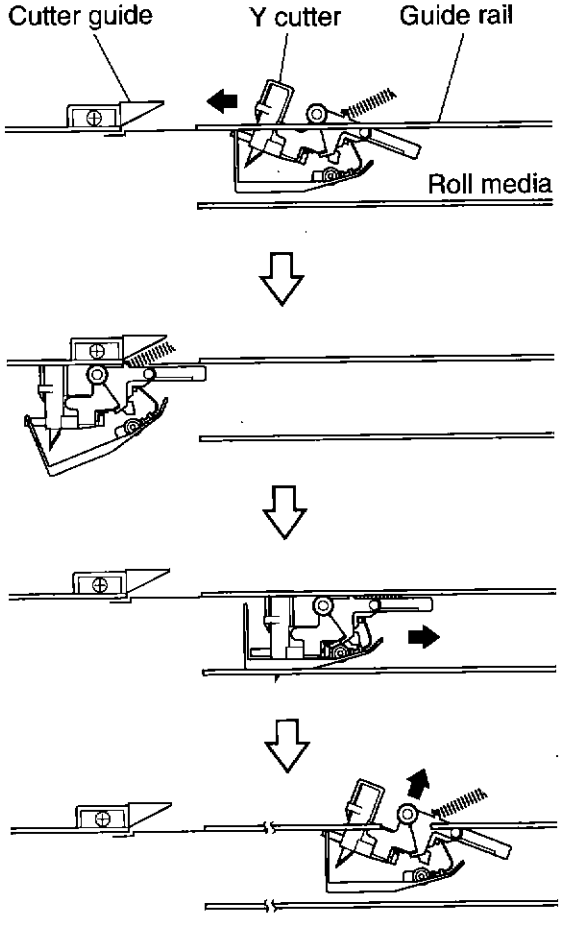

Figure 2-209

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3. Defective Cut Detection

When cutting heavy media, or the cutter blade is blunt, defective cutting might place a load on the cutter. If this happens, the torque limitter on the cutter is canceled and the cutter automatically rises. This is to prevent the carriage from stopping during cutting and to prevent printed media from jamming.

When the cutter has risen up, this is detected by cutter sensor (PS13) and an error code [42] is displayed on the control panel.

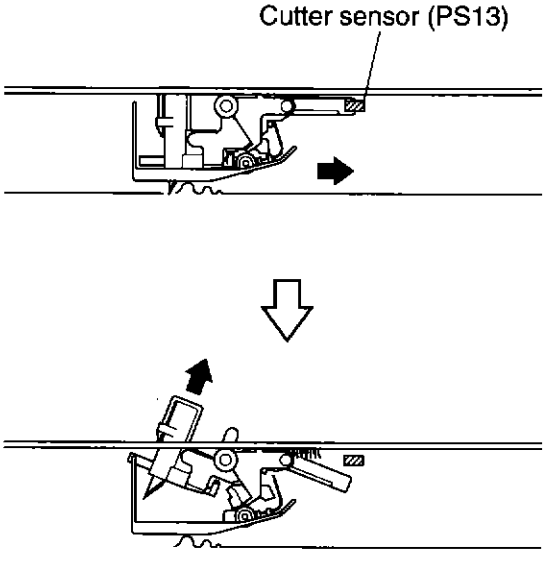

Figure 2-210

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III. BUBBLE JET

A. Bubble Jet Cartridge

1. Outline/Structure

Four bubble jet cartridges (Black (Bk), Cyan (C), Magenta (M), and Yellow (Y)) are used on this printer. Each of these comprise an integrated 128-nozzle head unit and ink cartridge.

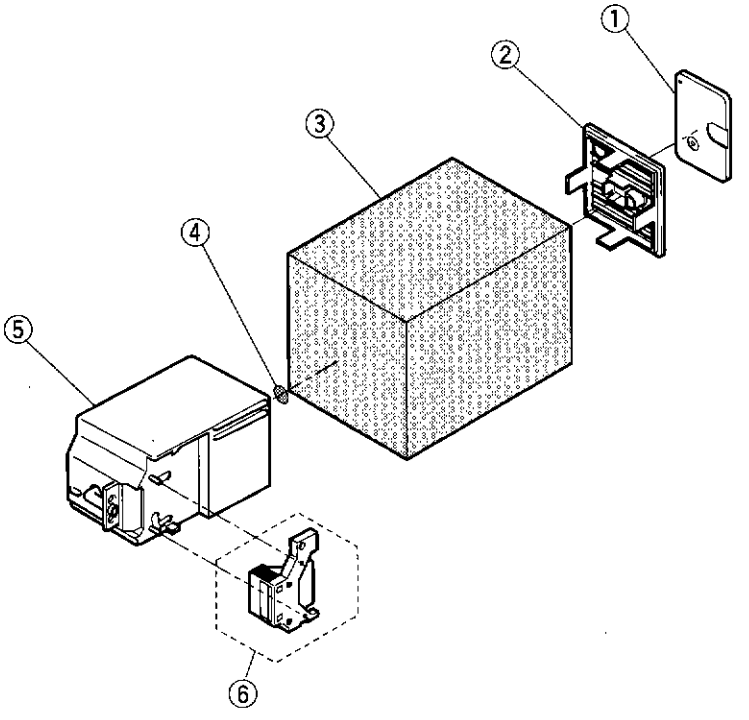

Figure 2-301

No.	Name	Function
①	Air ventilation plate	Provides ventilation for keeping the inside of the cartridge body at a constant pressure.
②	Cartridge cover	This plastic cover is fixed to the cartridge body to prevent ink from leaking from the cartridge.
③	Ink sponge	A sponge soaked with ink.
④	Ink filter	Filters the ink in the ink sponge.
⑤	Cartridge body	This plastic case for houses and joins the bubble jet head unit and ink sponge.
⑥	Bubble jet head unit	Receives the ink from the ink sponge and feeds ink to the 128 bubble jet nozzles.

Table 2-301

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2. Bubble Jet Head

After dust is filtered by the mesh ink filter, ink in the ink sponge is send to the bubble jet nozzles via the joint pipe of the cartridge body.

When head drive current flows to the heater plate in the nozzles, the ink boils to generate lots of bubbles. Finally, these bubbles boil to form on one single bubble. The head drive current is stopped before the ink droplet leaves the nozzle. Bubbles continue to be formed by residual heat in the heater, and ink droplets are sprayed from the nozzle tips.

After the ink droplet is sprayed, the nozzles are filled again with ink from the ink sponge by capillary action and cool the heater.

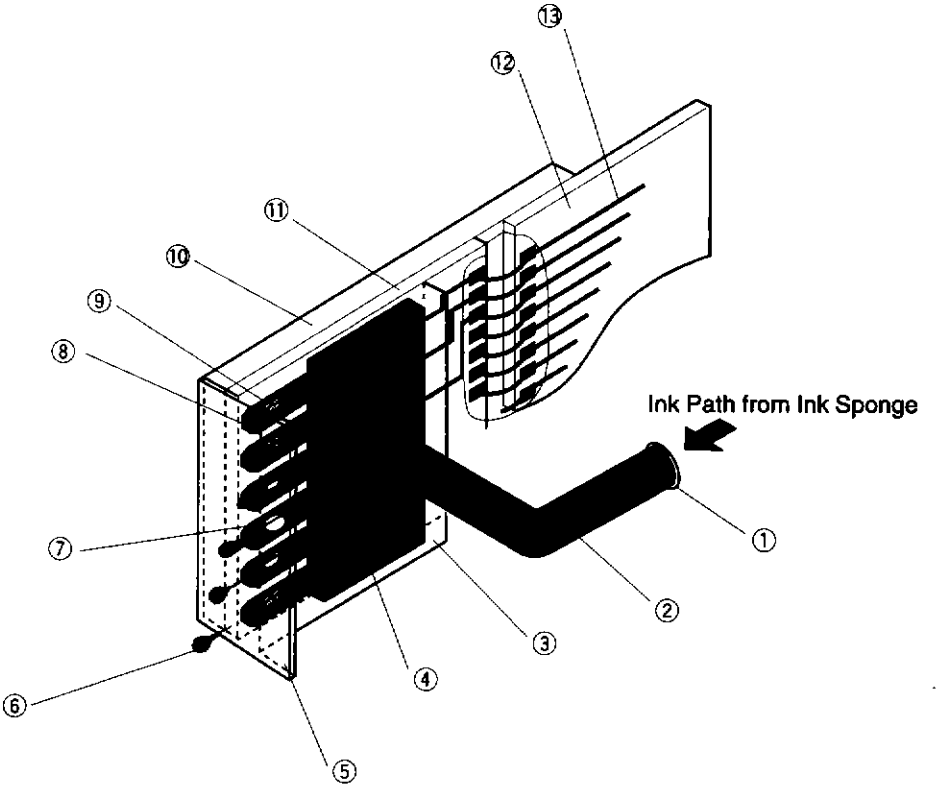

Figure 2-302

① Ink filter
② Joint pipe
③ Plastic cover
④ Ink chamber
⑤ Face plate
⑥ Ink droplets
⑦ Bubble
⑧ Nozzle holes
⑨ Heater plate
⑩ Aluminum base plate
⑪ Silicon plate
⑫ PCB
⑬ Signal circuit

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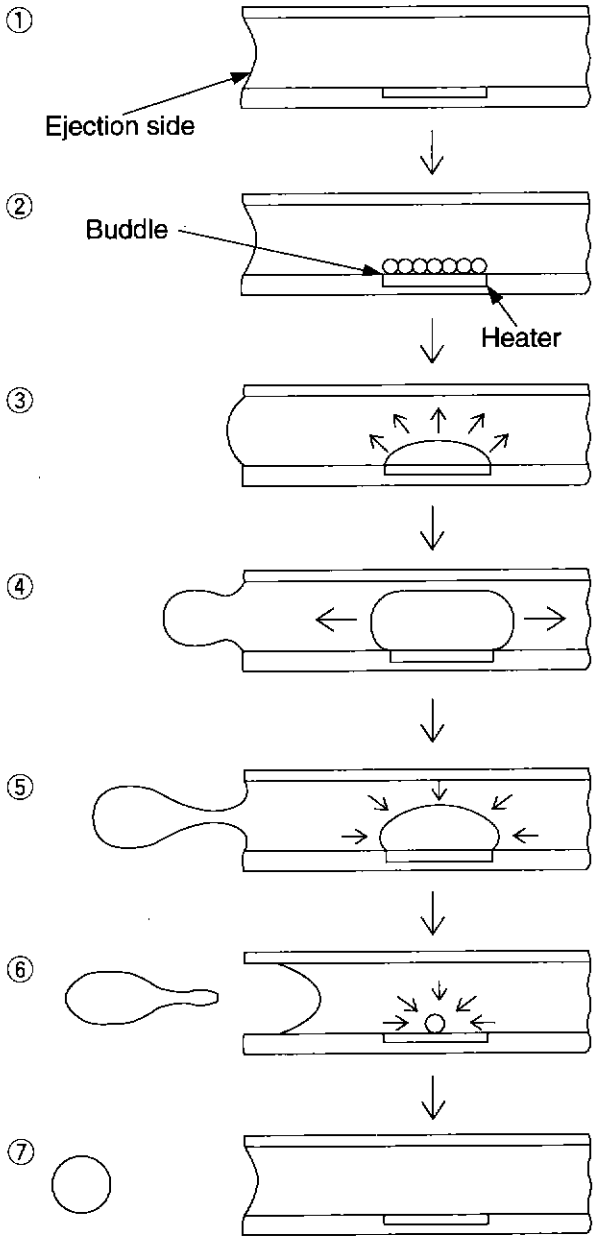
3. Principle of Ink Discharge



Normal
The surface tension of the ink and the external pressure are balanced.

Heating
The ink next to the heater becomes heated and small bubbles are generated.

Boiling
The ink evaporates rapidly, and the small bubbles grow larger into a single bubble.

Expansion
The bubble expands to its maximum size, and ink is forced outward.

Contraction
The bubble contracts, and at the same time, the tip of the ink pillar is ejected.

Vanishing

Ink supply
Ink is supplied to the orifice by capillary action.

Figure 2-303

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4. Nozzle Arrangement

128 bubble jet nozzles are arranged in a vertical row at intervals of 1/360".

Black BJ Cartridge [BC-20]

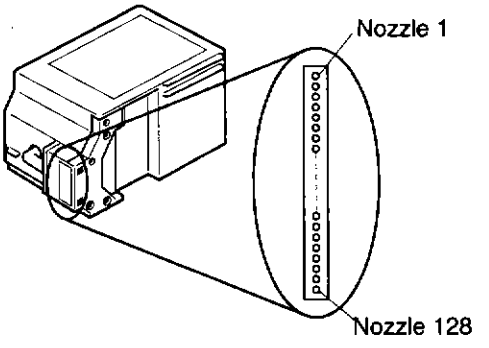

Figure 2-304

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B. Head Drive

1. Electrical Structure of Head Cartridge

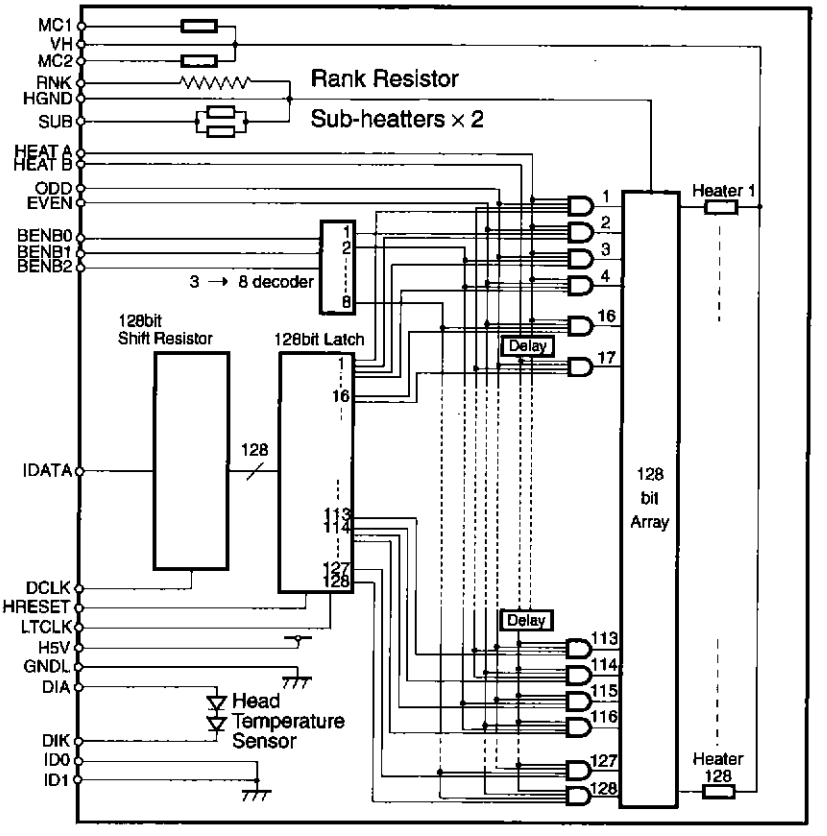

Figure 2-305

- 128-bit shift registor
  Stores the image data (IDATA) transferred by the timing of the DCLK signal from the engine controller.
- 128-bit latch
  Stores the image data (IDATA) transferred by the timing of LTCLK signal from the 128-bit shift registor.
- 3 → 8 decoder
  Outputs the timing signals for dividing by eight the timing for heating all heaters based upon input signals BENB0, 1 and 2.
- Heaters 1 to 128
  The heaters are for heating the bubble jet nozzles. These heaters are powered by a combination of the timing signals generated by the 3 → 8 decoder and the ODD, EVEN and HEAT signals.
- Sub-heater
  These heaters are for adjusting the head temperature for stabilizing the amount of ink discharge.
- Rank resistor
  Heater unevenness is ranked by resistance for carrying out control suited to each cartridge.
- Head temperature sensor
  Temperature changes caused by flow of ink in the nozzles are detected by a diode.

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2. Print Signals

Image data (IDATA) sent to the shift registor by the timing of DCLK is latched at the rising edge of LTCLK signal according to the signals from the linear encoder. Image data is then input to the AND circuits of each nozzle.

BENB 0, 1 and 2 signals are converted to eight signals by the 3 → 8 decoder, and are divided by eight for each of the nozzles. The purpose of this is to divide the head drive to prevent a reduced load placed on the power supply and delay in ink refilling.

For the ODD and EVEN signals, a pre-pulse intended to raise the head temperature to the appropriate temperature and a main pulse for discharging ink are output. The pulse width of these pulse signals is variably controlled according to the head rank and head temperature to stabilize the amount of ink discharge.

These signals and the HEAT signal are input to the AND circuit of each of the nozzles, and each of the heaters are driven by their output.

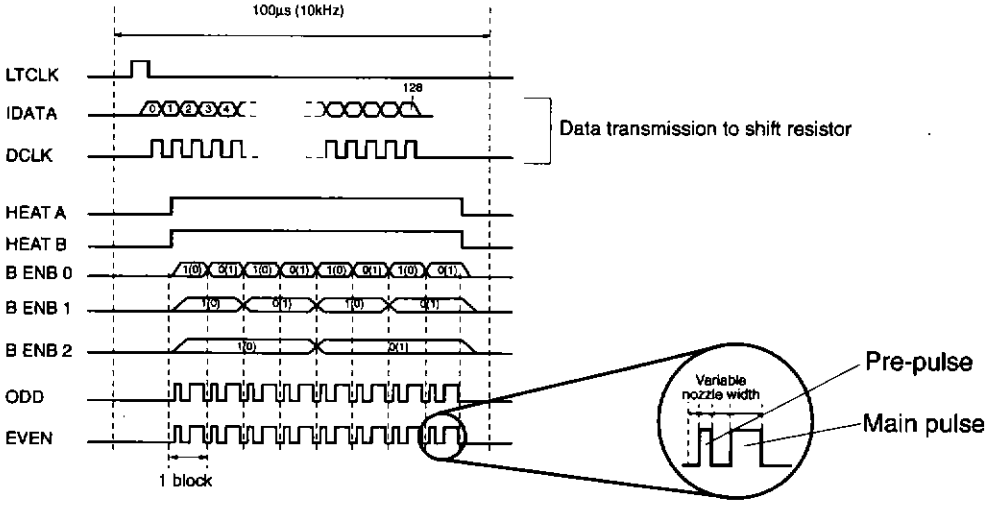

Figure 2-306

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C. Remaining Ink Detection

1. Outline

This printer supplies ink to the ink cartridges from the ink bottles via ink supply tubes.

For this reason, detection of the remaining amount of ink is not carried out at the ink cartridges but at each of the ink bottles.

(For details, see "Ink Bottle Case" on page x-x.)

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IV. PURGE UNIT

A. Outline

The purge unit on this printer is provided with capping and head cleaning functions. The capping function is for preventing the head from drying or dirt and dust from adhering to the head. The head cleaning function is for maintaining the head in an optimum working state.

These functions are driven by purge motor (M3) and two solenoids (SL1, SL2). Purge motor drive is switched to rotate a cap cam and guide roller by two one-way gears.

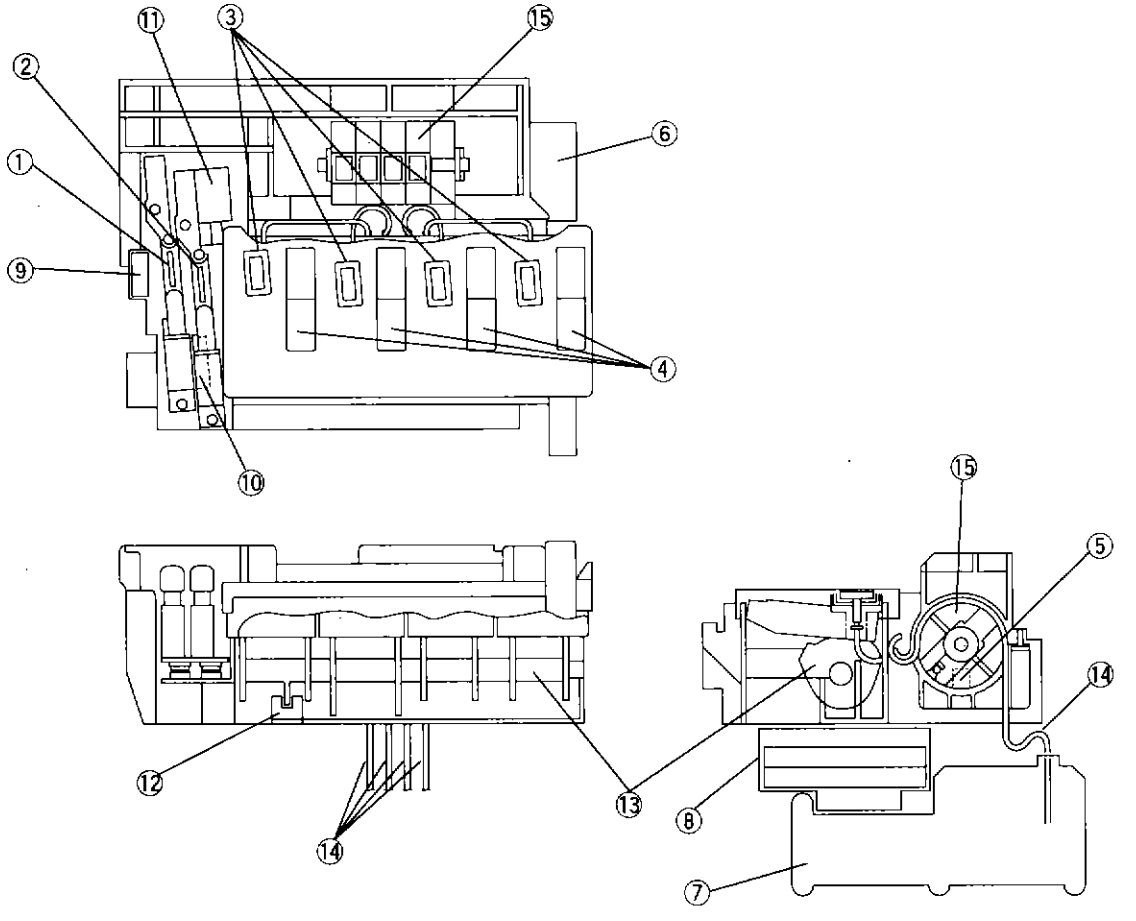

Figure 2-401

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The following table shows the structure of the purge unit.

No.	Name	Function
①	Wiper blade 1	Rises when the carriage retracts over wiper blade 1 to wipe ink from the surface of the Bk head.
②	Wiper blade 2	Rises when the carriage retracts over wiper blade 2 to wipe ink from the surfaces of the C, M and Y heads.
③	Cap	This cap is held by pressure against the head during capping and suction. The cap is connected to the feeder tube, and feeds sucked in waste ink to the feeder tube.
④	Waste ink absorber	It is held by pressure against the blade cleaner attached to the bottom surface of the carriage at the same time as the cap is held against the head. The waste ink absorber absorbs excess ink wiped by the blade cleaner from the wiper blade.
⑤	Pressure cam home position sensor (PS4)	Detects the rotating position of the guide roller.
⑥	Purge motor (M3)	Rotates the cap cam and guide roller.
⑦	Waste ink tank	Connected with the feeder tube, this tank stores sucked in waste ink.
⑧	Pre-discharge tank	Contains a drain sheet, and stores waste ink discharged by pre-discharge.
⑨	Pre-discharge receptacle	The head carries out pre-discharge towards this pre-discharge receptacle.
⑩	Wiper solenoid 1 (SL1)	Raises wiper blade 1.
⑪	Wiper solenoid 2 (SL2)	Raises wiper blade 2.
⑫	Cap cam home positions sensor (PS5)	Detects the rotating position of the cap cam.
⑬	Cap cam	Raises/lowers the cap by rotation action.
⑭	Feeder tube	Feeds sucked in waste ink to the waste ink tank.
⑮	Guide roller	Generates suction force by squeezing the feeder tube.

Table 2-401

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B. Capping Function

1. Outline

The carriage on this printer stands by at its home position when the printer is not printing. When the carriage is at its home position, the cap on the purge unit is pushed against the head to prevent the nozzles from drying or dist and dust from adhering to the nozzles.

2. Operation

After printing has ended, and wiping and pre-discharge are carried out, the carriage is returned to its home position, and all caps are raised and pushed against the head. Caps are raised or lowered by rotation of the cap cam by purge motor (M3).

Four cap cams are provided, and the position where the caps are lifted up changes according to the rotating position of the cap cams. The rotating positions of the cap cams are detected by cap cam home position sensor (PS5). Table 2-402 shows the relationship between the rotating positions of the cap cams from the cap cam home position sensor and the position where the caps area raised.

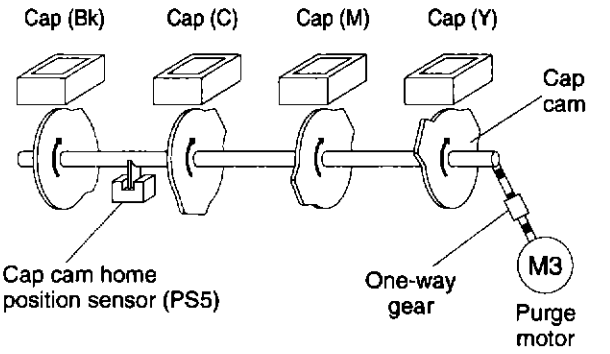

Figure 2-402

Position from Home Position Sensor	Capping Operation
10°	All head caps open
70°	Y head capping
130°	M head capping
190°	C head capping
250°	Bk head capping
310°	All head capping

Table 2-402

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C. Head Cleaning Functions

1. Outline

Head cleaning on this printer involves three operations: wiping, suction and pre-discharge. Wiping wipes ink and dust or dirt from the head surface. Pre-discharge discharges ink on the purge unit to maintain the head in an optimum working state. Suction sucks in ink or air bubbles inside the head nozzles.

2. Wiping Function

a. Outline

When the carriage retracts, the wiper blades are raised by wiper solenoids (SL1, SL2) to wipe ink from the head surface. Ink adhering to the wiper blades is absorbed by the blade cleaner on the carriage.

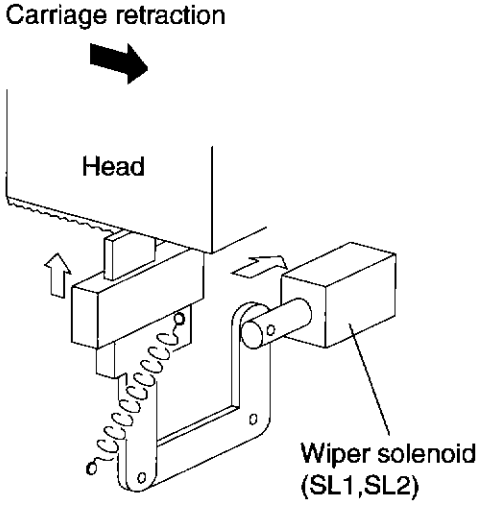

Figure 2-403

b. Operation

1) When the carriage is at the position left of the wiper blade, wiper solenoid 2 (SL2) is turned ON to raise wiper blade 2.

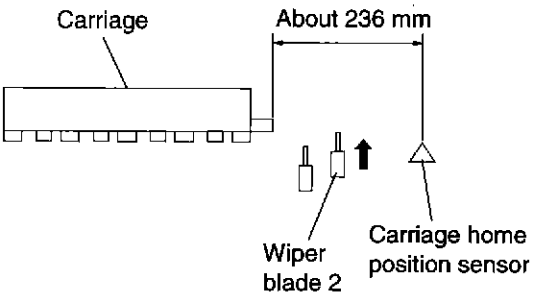

Figure 2-404

2) Ink adhering to the surface of head (Y) is wiped off by wiper blade 2 as the carriage retracts. Ink wiped off by the wiper blade is then wiped off by the blade cleaner. The blade cleaner is attached to the bottom of the carriage.

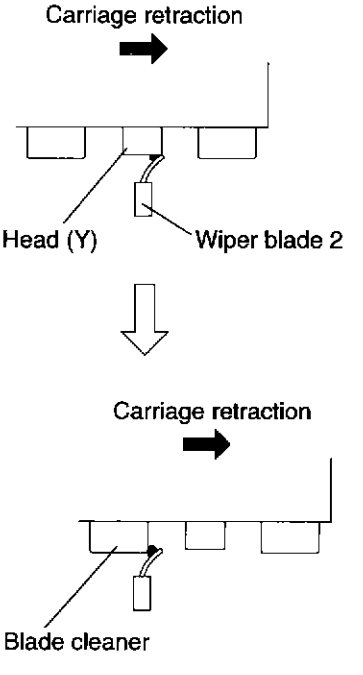

Figure 2-405

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3) The carriage continues to retract, heads (M) to (C) are wiped in that order, and wiper blade 2 is cleaned.
4) When head (C) has been wiped, wiper solenoid 1 (SL1) is turned ON to raise wiper blade 1 and wipe off ink on the surface of head (Bk).

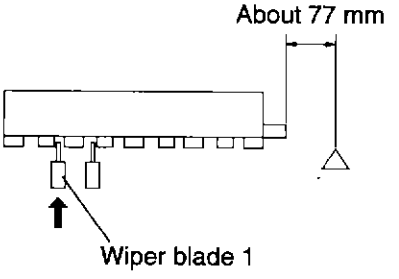

Figure 2-406

5) After wiping is completed, wiper solenoids 1 and 2 are turned OFF to lower wiper blades 1 and 2.
6) The carriage moves over the purge unit, and pre-discharge is carried out towards the caps.

c. TIMING

① After printing
Wiping is carried out after one print is output.

② After suction operation
Capping is canceled and wiping is carried out after suction operation is completed.

③ Dot count wiping
The number of ink dots discharged for each head from the start of the print is counted. If the count for each head exceeds the preset value, wiping is carried out at completion of the currently printing band. At the start of the print or immediately after wiping, this count is cleared to "0" (zero) for all heads.

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3. Pre-discharge

a. Outline

Pre-discharge is carried out to remove ink adhering to the inside of nozzles, to prevent the mixing of different colors of ink in color heads after wiping, and to maintain the nozzles in an optimum working state before starting printing. Pre-discharge involves discharging ink to the pre-discharge receptacle or caps.

b. Timing

① At start of printing

Ink is pre-discharged to the pre-discharge receptacle in the order Y, M, C and Bk heads before starting printing.

② During printing

The preset time that pre-discharge is carried out during printing is set for each of the heads. This time is calculated by the environmental temperature detected by the thermistor on the volume PCB and the head temperature detected by the head temperature sensor located in the vicinity of the head nozzles.

If a head reaches its preset time during printing, the carriage moves over the caps before printing in the advance direction and ink is pre-discharged simultaneously for all heads concerned.

The preset time is reset if a pre-discharge is carried out.

③ After wiping

The carriage moves over the caps and ink is discharged after ink on the head surfaces is wiped by the wiper blade.

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4. Suction Operation

a. Outline

By suction, the cap is held by pressure against the head and ink or air bubbles adhering inside the head nozzles are sucked in.

The cap is connected to the waste ink tank by a feeder tube, and sucked in ink is fed to the waste ink tank by this feeder tube.

b. Operation

Suction is carried out by rotation of a guide roller driven by purge motor (M3) inside the purge unit.

The rotating position of the guide roller is detected by pressure cam home position sensor (PS4).

When the guide roller is rotated during capping, the pressure cam starts to squeeze the feeder tube from the position 50° from the home position. The pressure cam stops for about two seconds when the guide roller has rotated by 170°. Suction force is generated by restoring the squeezed feeder tube during this time to suck ink from inside the head nozzles.

The guide roller is then rotated and then stopped for about two seconds when its rotating position is 200° and 230°. The guide roller is then rotated to its home position.

c. Empty suction

After suction, capping of all heads is released. The guide roller is then rotated continuously for four operations to squeeze the feeder tube. This feeds ink accumulated in the feeder tube to the waste ink tank.

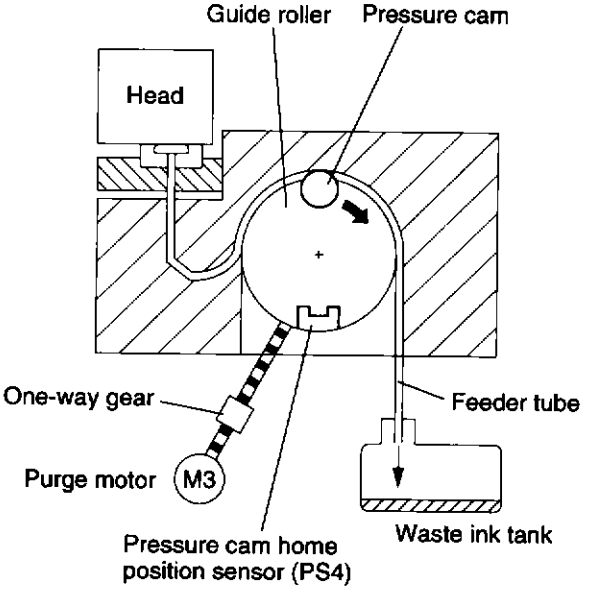

Figure 2-407

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5. Head Cleaning

Head cleaning involves a combination of wiping, pre-discharge and suction, and is carried out at the following timings.

① User cleaning 1

Head cleaning is carried out by key operation on the control panel.

- One suction operation of all heads

② User cleaning 2

Head cleaning is carried out by key operation on the control panel.

- One suction operation of specified head

③ Cartridge Replacement Suction 1

Head cleaning is carried out when the cartridge is replaced with a new one.

- Two suction operations of the replaced head

④ Cartridge Replacement Suction 2

Head cleaning is carried out when the cartridge fixing knob is turned to release or attach the cartridge.

- One suction operation of all heads

⑤ Timer Suction

Head cleaning is carried out when the printer is standing by if suction has not been carried out 72 hours since the last suction operation.

- One suction operation of relevant head

⑥ Dot Count Suction 1

The number of dots discharged since the last suction operation is counted and stored in RAM on the engine controller PCB. When this count exceeds a preset value, head cleaning is carried out at the end of printing.

The count is cleared to "0" (zero) when suction is carried out or the cartridge is replaced.

- One suction operation of relevant head

⑦ Dot Count Suction 2

Head cleaning is carried out at the end of printing when the environmental temperature detected by the thermistor on the volume PCB falls below 23°C, or when the number of discharged ink dots exceeds the preset value.

With dot count suction 2, the preset count value is set lower than that of dot count suction 1. Also, the suction amount can be reduced by canceling capping during suction.

- One suction operation of relevant head

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D. Waste Ink Tank

1. Pre-discharge Tank

The waste ink pre-discharged to the pre-discharge receptacle is absorbed by the drain sheet in the pre-discharge tank. This drain sheet can also absorb waste ink while the printer is still within its service life.

2. Waste Ink Tank

Waste ink sucked from the head nozzles by suction operation is fed to the waste ink tank from the feeder tube by empty suction, and is held as it is in a liquid state.

This printer is provided with a waste ink fill detection function. The amount of ink in the waste ink tank is detected by counting the numbers of suctions. When the waste ink count value exceeds the preset count, error code [C8] is displayed when the next suction operation starts.

To restore operation, replace the full waste ink tank and reset the counter value in the service mode.

Reference

Errors can be temporarily reset by turning the power OFF then back ON again. Errors cannot be reset when timer suction has operated.

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V. TRANSPORTATION SYSTEM

A. Outline

Media is fed and discharged by rotation of a feed roller and media discharge roller driven by the X-axis motor (M1).

The path of the media feed unit is switched by the path change plate when changing from cut sheet media to roll media, and vice versa.

Figure 2-501 shows how the transportation system is configured.

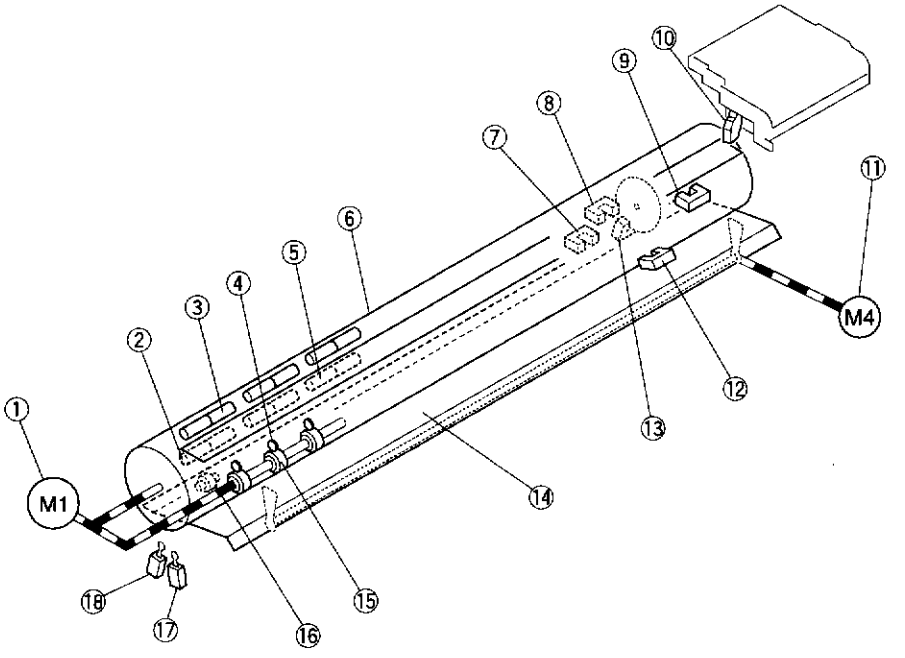

Figure 2-501

① X-axis motor (M1)
② Pinch roller 1
③ Pinch roller 2
④ Spur
⑤ Platen
⑥ Feed roller
⑦ Roll media detection sensor (PS2)
⑧ Cut sheet detection sensor (PS1)
⑨ Media discharge sensor (PS6)
⑩ Media sensor
⑪ Path change motor (M4)
⑫ Cut sheet trailing edge sensor (PS7)
⑬ Media feed detection sensor (PS8)
⑭ Path change plate
⑮ Media discharge roller
⑯ Roll media pressure roller
⑰ Roll media position switch (MSW2)
⑱ Cut sheet position switch (MSW1)

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B. X-axis Motor Control

1. Outline

The X-axis motor (M1) is a 4-phase stepping motor.

Figure 2-502 shows the circuits that control this X-axis motor. The main functions of this circuit are as follows:

①X-axis motor rotation speed control
②X-axis motor rotation direction control

2. Operation

The motor driver controls X-axis motor drive by X-axis motor pulse signals (FMA, FMAN, FMB, FMBN) and X-axis motor current signals (CUR0, CUR1, CUR2) output by the engine controller PCB.

The engine controller PCB controls the direction rotation and speed by varying the phases and frequencies of the four X-axis motor pulse signals. The current control circuit in the motor driver controls high-speed response of the X-axis motor, low-vibration drive and low-noise drive in response to input of X-axis motor current signals by varying the size of the drive signals output to the motor.

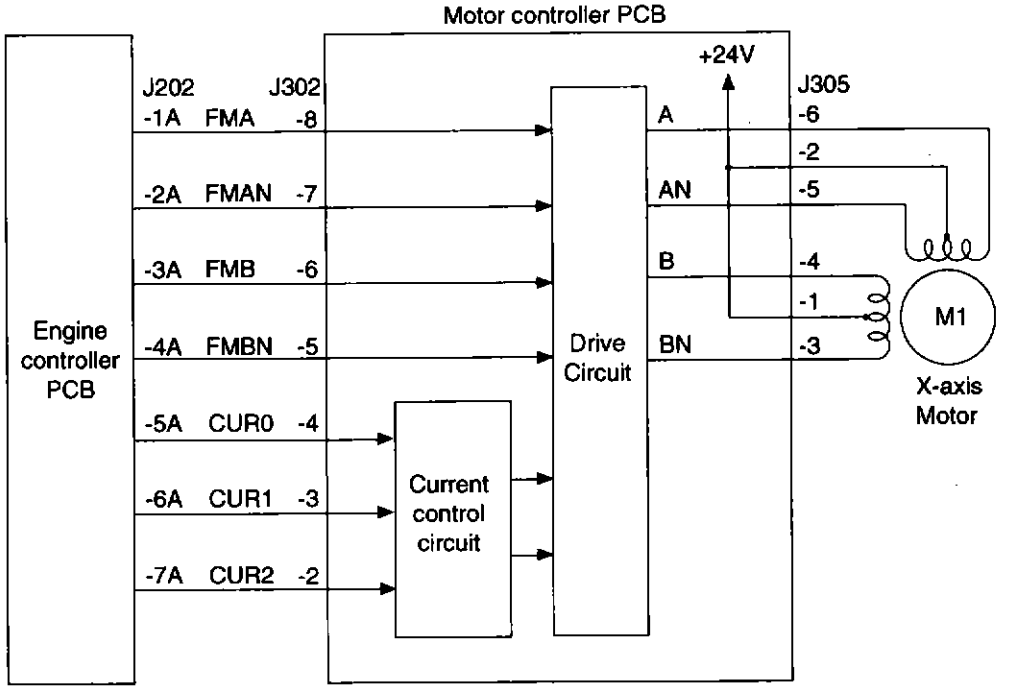

Figure 2-502

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3. Media Feed Status Detection

Media may not be fed for the following reasons even though the engine controller PCB is outputting drive signals to the X-axis motor (M1). So, the media feed status is monitored by a media feed detection sensor (PS8) to prevent continuous printing at the same position on the media.

- When a media jam is not detected by the sensor, and media feed stops even though the feed roller is still rotating
- When the trailing edge of roll media is glued or taped to the core shaft, and media feed stops even though the feed roller is still rotating when roll media has run out

The encoder plate on the feed detection unit located at the rear of the feed roller contacts the media and rotates in sync with media feed. Media feed detection sensor (PS8) reads the slots on the encoder plate and outputs signals 0, 1 to the engine controller PCB.

If these signals stop during media feed, the engine controller PCB judges that a defect has occurred in media feed and stops the X-axis motor (M1). Error code [C1] is then displayed on the control panel.

Even if media is not being fed, the encoder plate still contacts the feed roller to detect the rotating state of the X-axis motor (M1).

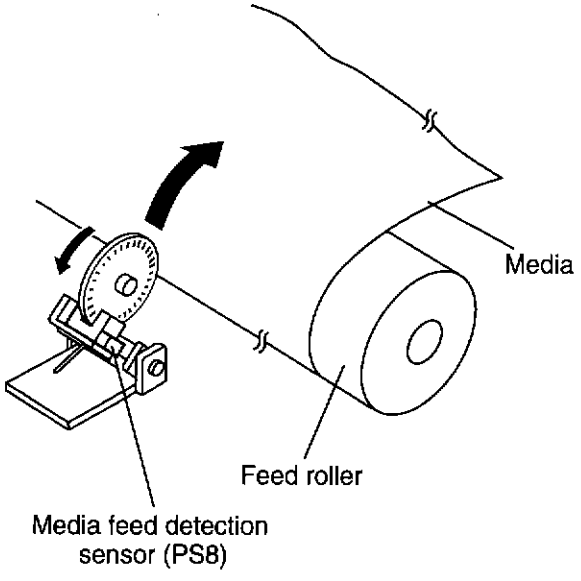

Figure 2-503

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C. Media Feed Path

1. Changing the Media Feed Path

The path of the media feed unit is switched by the path change plate when changing from cut sheet media to roll media, and vice versa.

When the ROLL/SHEET key on the control panel is pressed, the path change motor (M4) rotates. This rotation causes a gear to operate the cam to raise or lower the path change plate. The position of the path change plate is detected by cut sheet media position switch (MSW1) and roll media position switch (MSW2).

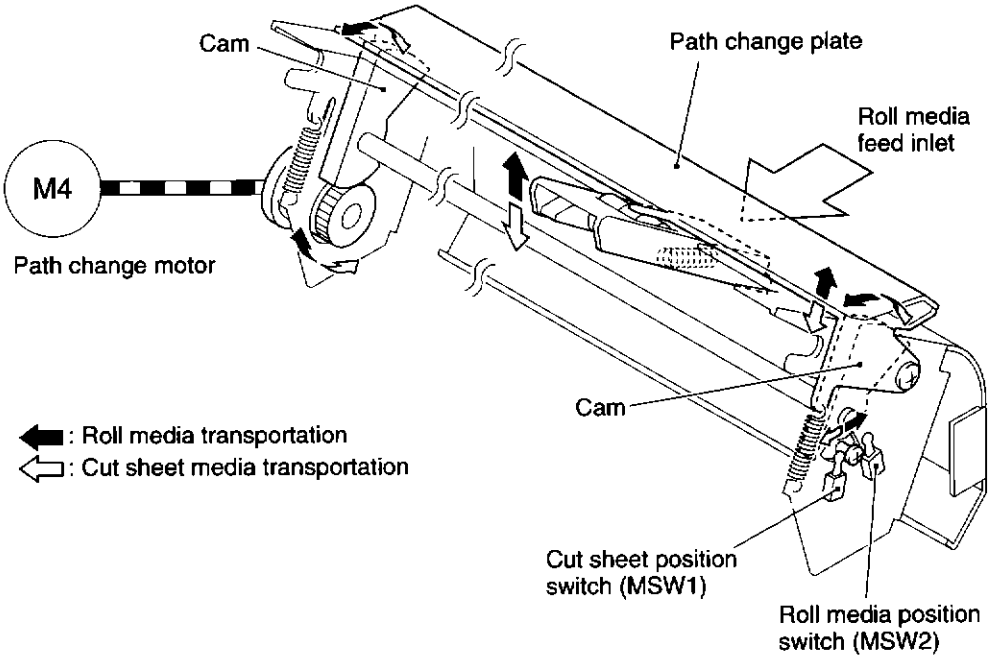

Figure 2-504

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2. Media Feed Path

Figure 2-505 shows the feed path of cut sheet media, and Figure 2-506 shows the feed path of roll media.

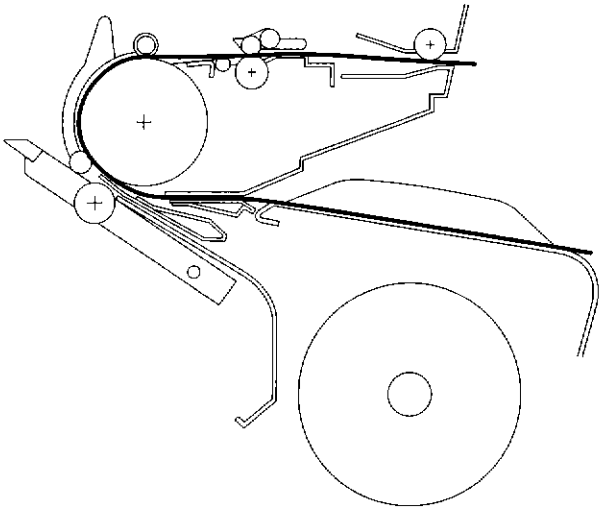

Figure 2-505

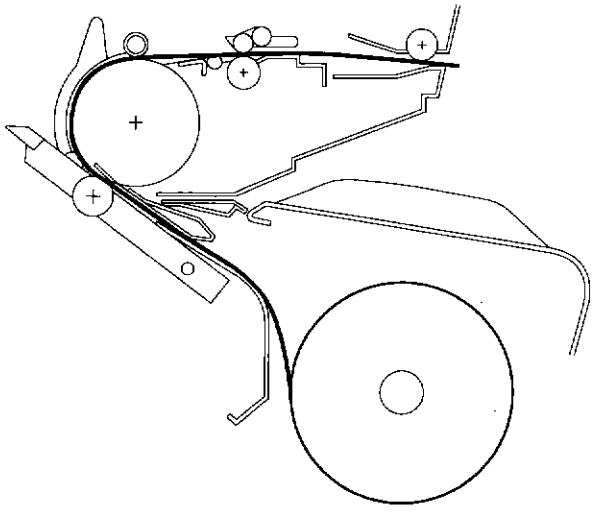

Figure 2-506

3. Roll Media Standby Position

When the media is changed to cut sheet media with roll media already loaded on the printer, the leading edge of the roll media is retracted until it passes cut sheet detection sensor (PS1). The path change plate switches the path, and the printer stands by insertion of cut sheet media.

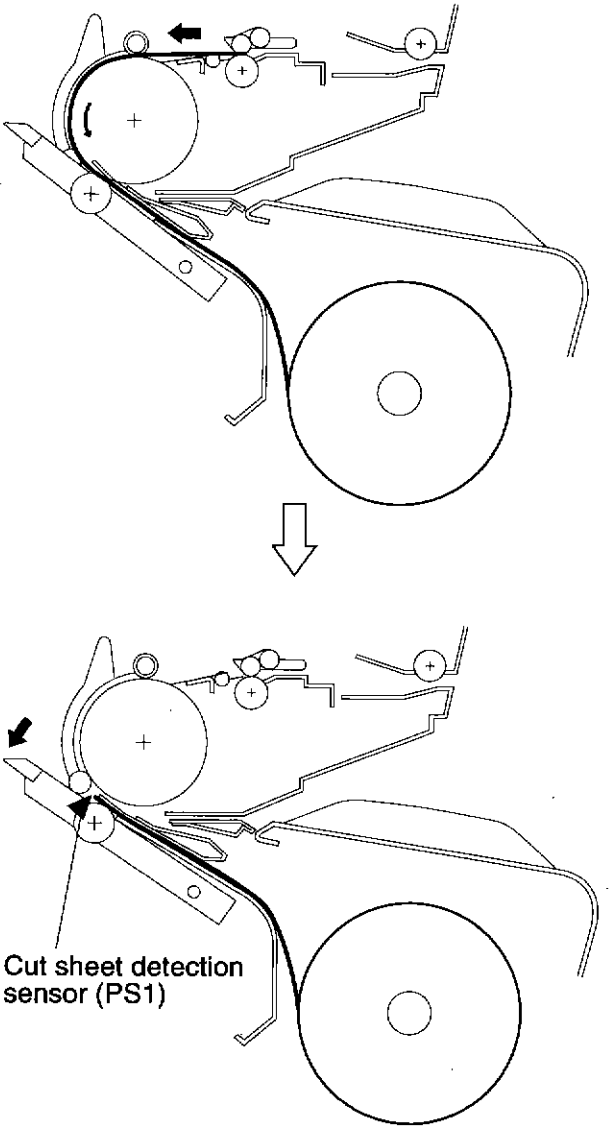

Figure 2-507

When the media is changed to roll media with roll media loaded at the roll media standby position, the path change plate switches the path. The leading edge of the roll media is then advanced to the printing standby position, and the printer stands by for data from the computer.

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D. Media Feed

1. Cut Sheet Feed

About 1.5 seconds after cut sheet media is inserted in the media inlet, and the cut sheet detection sensor (PS1) and cut sheet trailing edge detection sensor (PS7) turn ON simultaneously, the X-axis motor rotates to start to feed the cut sheet media.

At the same time, media width and media skew are detected by the media sensors on the carriage, and media length and media feed errors are detected by the sensors along the media feed path.

When the media has been fed, the printer stops the leading edge of the media at the print standby position, and stands by for transfer of data from the computer.

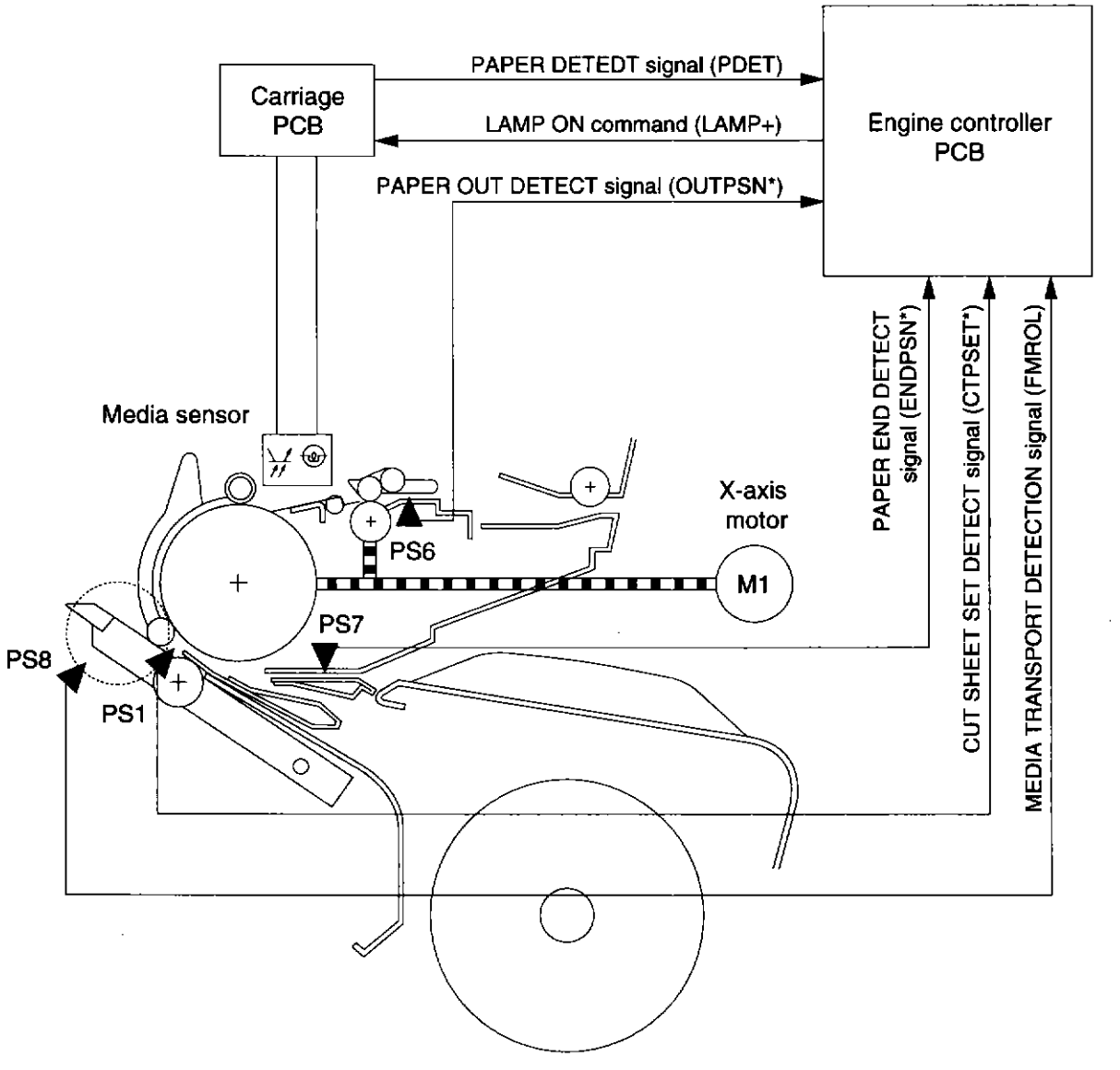

Figure 2-508

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2. Roll Media Feed

About 1.5 seconds after roll media is inserted in the media inlet and the roll media detection sensor (PS2) turns ON, the X-axis motor rotates to start to feed the roll media.

The leading edge of the roll media is stopped at a position about 300 mm past media discharge sensor (PS6), and the "skew correction message" is displayed on the message display.

After the user corrects skew and closes the dust cover, the roll media is retracted and its leading edge is returned to the platen. Media width and skew are then detected by the media sensors on the carriage. The leading edge of the roll media is then trimmed and cut, and stopped at the print standby position. The printer then stands by for transfer of data from the computer.

During feeding of roll media, media feed error is detected by the sensors along the media feed path.

Reference

The purpose of skew correction is to ensure that media is fed straight even if the leading edge of the roll media is not cut at a right angle.

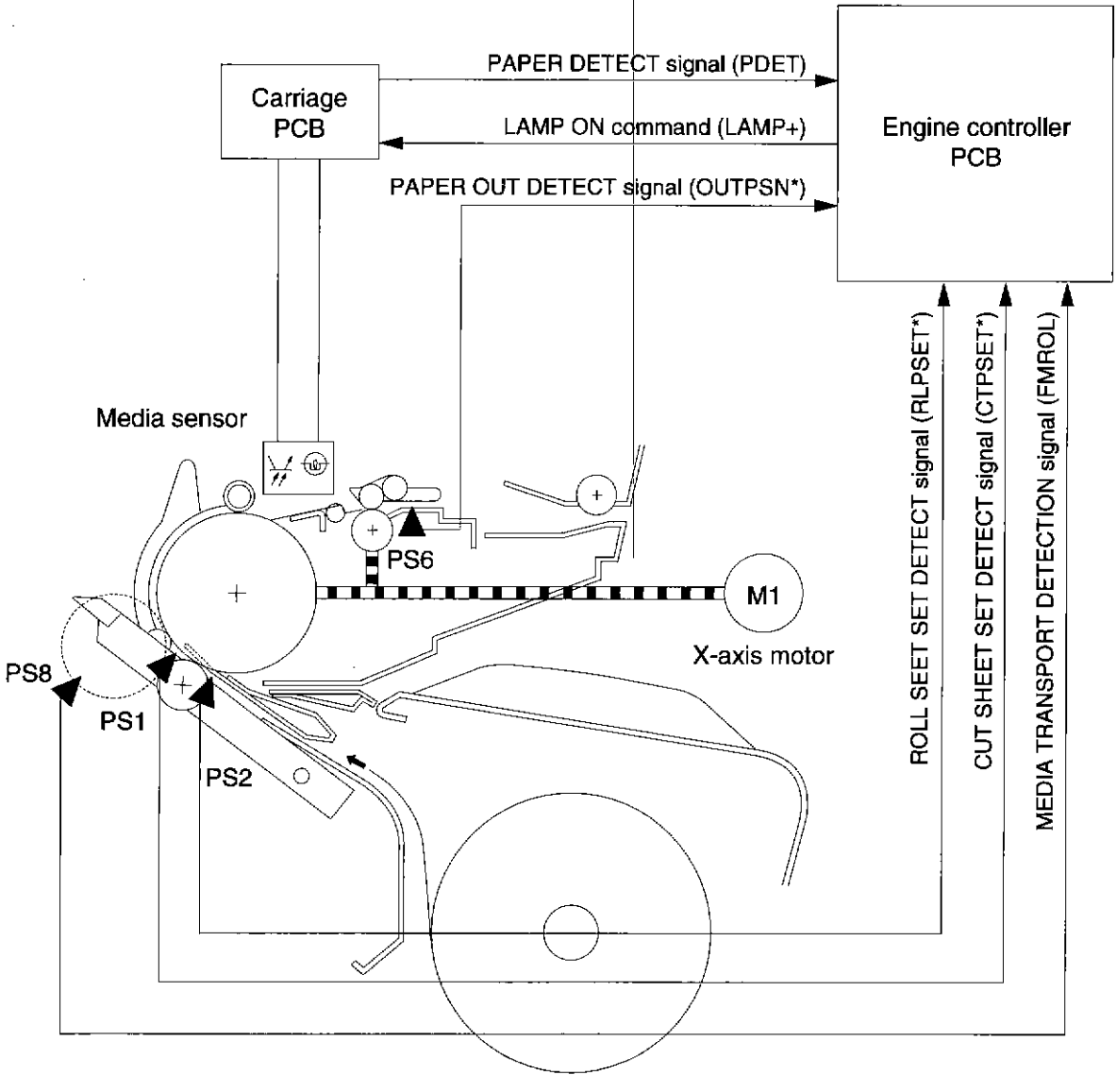

Figure 2-509

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3. Media Length Detection

When cut sheet media is loaded, the media is fed until its trailing edge passes the cut sheet trailing edge sensor (PS7). The engine controller detects the length of the media by the amount that the media is fed.

The media length is calculated by the following lengths:

I: Length that the leading edge is fed after leaving the media discharge sensor (PS6)

II: Distance from the media discharge sensor (PS6) to the cut sheet trailing edge sensor (PS7) (193 mm)

III: Length that the trailing edge is fed after leaving the cut sheet trailing edge sensor (PS7)

- Media length = I + II - III

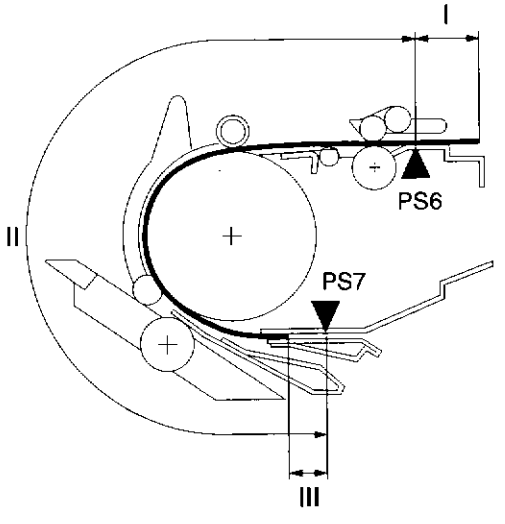

Figure 2-510

4. Print Standby Position

Media that is fed on the platen stops at a position fed by the leading edge margin (about 35 mm) from the cartridge head (Bk) , and the printer stands by to print the first band.

Reference

The leading edge of the media is held down at the printing standby position by a spur to prevent it from rising up from the platen.

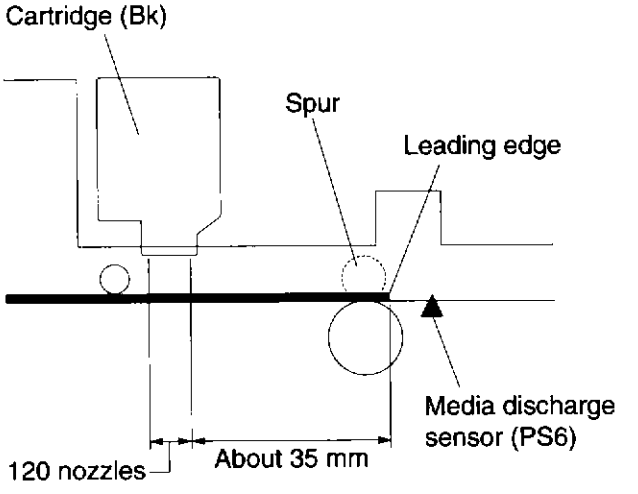

Figure 2-511

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E. Transportation/Media Discharge

1. Transportation Operation

Media feed is carried out alternately with carriage operation during printing.

During carriage operation, operation of the feed roller is stopped. When printing of the first band has ended, the feed roller feed the media by one band for the next print.

If there are areas in the image being printed that do not contain image data to be printed, the carriage does not operate and the media is fed to the band containing the next printing data.

Reference

To maintain a uniform distance between the head and media during printing, rotation of the media discharge roller is accelerated by the feed roller to ensure that the surface of the media on the platen is flat.

2. Media Discharge

The printer discharges the media when it has finished printing the final band.

When discharging cut sheet media, the trailing edge of the media is fed to a position 19 mm behind the center of the media discharge roller and discharged.

When media is cut when discharging roll media, the media is cut before it is fed to the printing standby position.

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F. Jam Detection

The printer judges whether or not media is being fed correctly by reading the signals from the following sensors at check timing preset to the engine controller.

- Cut sheet detection sensor (PS1)
- Roll media detection sensor (PS2)
- Media discharge sensor (PS6)
- Cut sheet trailing edge sensor (PS7)

When the engine controller judges a jam, it automatically stops mechanical operation. The jam message and error code are displayed in the message display, and the error indicator lights.

The printer also judges as a media jam when a jam during media feed or discharge causes spur unit to rise up and the feeder open/close sensor (PS9) turns ON.

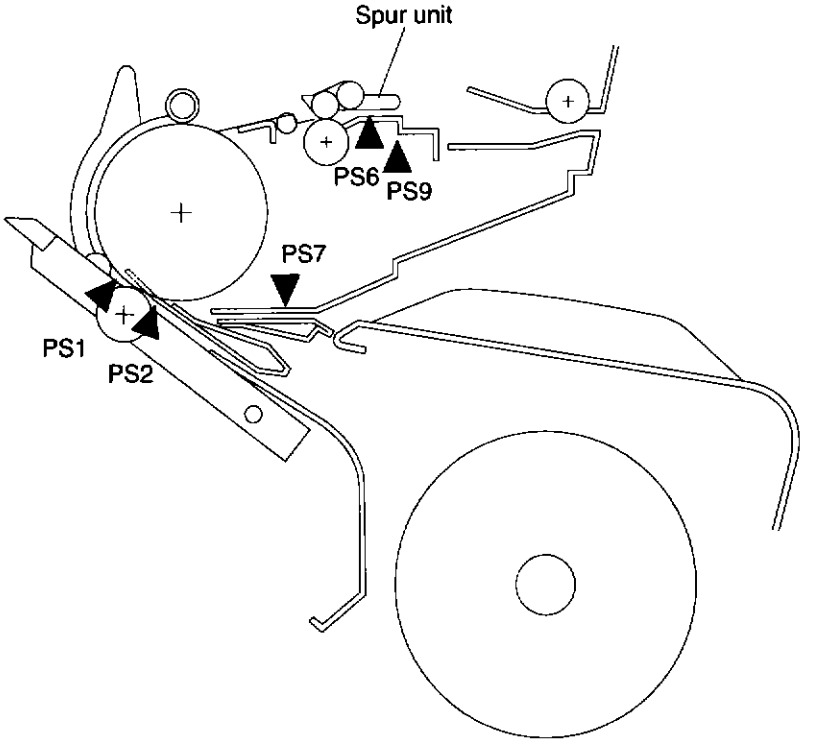

Figure 2-512

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The engine controller judges that a jam has occurred in the following instances;

Error Code	Sensor Name	Type of Jam	Timing
4E	• Cut sheet detection sensor (PS1) • Feeder open/close sensor (PS9)	Delay	• When PS1 does not turn ON even if the media is fed by the preset amount after the roll media has started to be fed • When media has been pulled out after cut sheet media feed has started • When PS9 turns ON before the leading edge of the media has reached the platen after media feed has started
45	• Media discharge sensor (PS6) • Feeder open/close sensor (PS9)	Delay	• When PS6 does not turn ON even if the media is fed by the preset amount after media feed has started (when leading edge of 1st media is detected) • When PS9 turns ON before the leading edge of the media has reached PS6 after media feed has started (when leading edge of 1st media is detected)
43	• Media discharge sensor (PS6) • Feeder open/close sensor (PS9)	Delay	• When PS6 does not turn ON even if the media is fed by the preset amount after media feed has started (when leading edge of 2nd media is detected) • When PS9 turns ON before the leading edge of the media has reached PS6 after media feed has started (when leading edge of 2nd media is detected)
56	• Media discharge sensor (PS6) • Feeder open/close sensor (PS9)	Stationary	• When PS6 turns OFF even if the media is fed by the preset amount after media feed has started • When PS9 turns ON before the leading edge of the media passes PS6 after media feed has started
57	• Feeder open/close sensor (PS9)	–	When PS9 turns ON during skew detection of the cut sheet media
58	• Feeder open/close sensor (PS9)	–	When PS9 turns ON during skew detection of the roll media
48	• Cut sheet trailing edge sensor (PS7) • Feeder open/close sensor (PS9)	Delay	• When PS7 does not turn OFF even if media is fed by the preset amount at media length detection after cut sheet media feed is started • When PS9 turns ON at media length detection after cut sheet media feed is started

Table 2-501 (1/2)

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Error Code	Sensor Name	Type of Jam	Timing
52	• Media discharge sensor (PS6) • Feeder open/close sensor (PS9)	Delay	• When PS6 does not turn OFF even if media is fed by the preset amount when the leading edge of the roll media is returned to the print standby position after the roll media is cut • When PS9 turns ON before the leading edge of the roll media passes PS6 when the leading edge of the roll media is returned to the print standby position after the roll media is cut
41	• Cut sheet detection sensor (PS1) • Feeder open/close sensor (PS9)	Stationary	• When PS1 does not turn OFF even if roll media is fed by the preset amount when the path is changed • When PS9 turns ON before the leading edge of roll media passes PS1 when the path is changed
50	• Cut sheet detection sensor (PS1) • Feeder open/close sensor (PS9)	Stationary	• When PS1 does not turn OFF even if the media is fed by the preset amount when the cut sheet media is retracted so that it is drawn out of the printer • When PS9 turns ON before the leading edge of the cut sheet media leaves PS1 when the cut sheet media is retracted so that it is drawn out of the printer
51	• Feeder open/close sensor (PS9)	–	When PS9 turns ON after the trailing edge of the cut sheet media leaves PS1 when the cut sheet media is advanced so that it is drawn out of the printer
55	• Cut sheet detection sensor (PS1) • Feeder open/close sensor (PS9)	Stationary	• When PS1 does not turn OFF even if the media is fed by the preset amount when the cut sheet media is advanced so that it is drawn out of the printer • When PS9 turns ON before the trailing edge of the cut sheet media leaves PS1 when the cut sheet media is advanced so that it is drawn out of the printer
61	• Feeder open/close sensor (PS9)	–	When PS9 turns ON when media is fed

Table 2-501 (2/2)

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VI. INK BOTTLE CASE

A. Outline

The ink bottle case consists of the ink bottle, the buffer section and the ink level detection section. Four color bottles: black (Bk), cyan blue (C), magenta (M) and yellow (Y) can be set.

The ink bottle capacity is about 330ml and the same amount of ink is always supplied to the bubble jet cartridge through the ink supply tube.

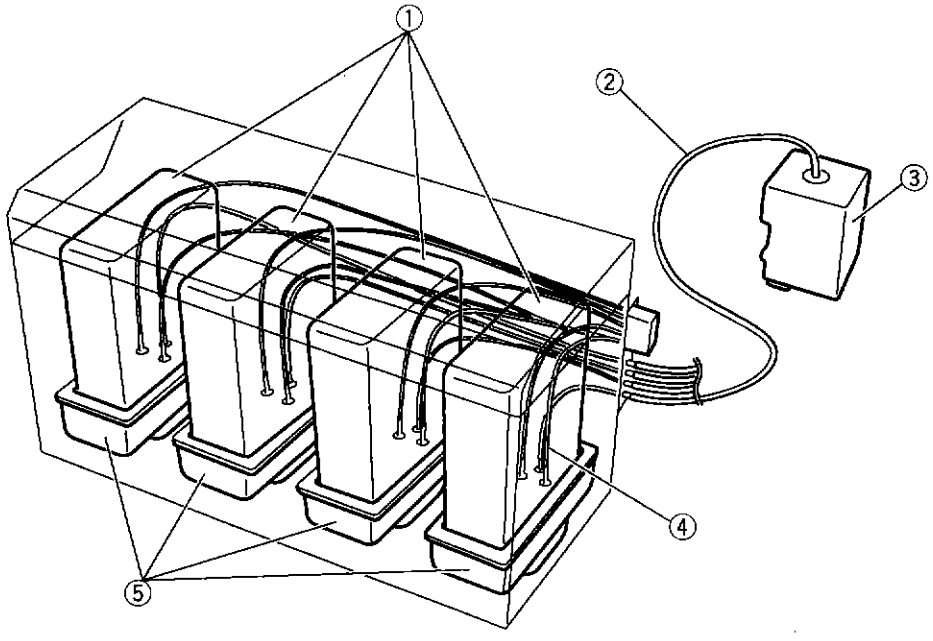

Figure 2-601

① Ink bottle (330 ml)
② Ink supply tube
③ Bubble jet cartridge (44 ml)
④ Ink level detection section
⑤ Buffer section

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B. Ink Supply Principle

Figure 2-602 shows the supply route from the ink bottle to the bubble jet cartridge. The ink level in the buffer section is set to 40 mm below the bubble jet cartridge head position.

1. Ink supply from the ink bottle to the buffer section

The ink level in the buffer section covers the ink supply outlet of the ink bottle to avoid too much supply of ink. When the level in the buffer section is lowered, the ink supply outlet of the ink bottle opens and the ink is supplied.

2. Ink supply from the buffer section to the bubble jet cartridge

When the amount of ink in the cartridge decreases, the inside pressure in the cartridge is lowered and the ink is supplied from the buffer section.

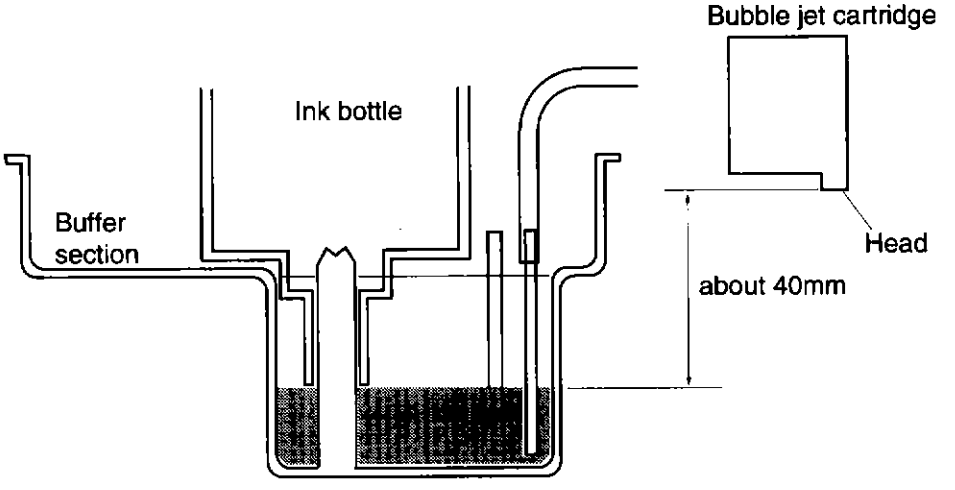

Figure 2-602

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C. Ink Level Detection

1. Outline

This machine detects the ink level of each ink bottle in two stages. When the ink reaches level ① as shown in Figure 2-603 after the printing is completed, the machine is returned to off-line mode and the warning message informing the user that the tank is near empty is indicated on the message display on the control panel.

Then, the cumulative number of ink dots discharged from the head are counted and when the ink reaches level ② as shown in Figure 2-603 (6 ml less than the condition in level ①), the warning message informing the user that the tank is empty is indicated on the message display on the control panel and the machine is stopped after the printing is completed.

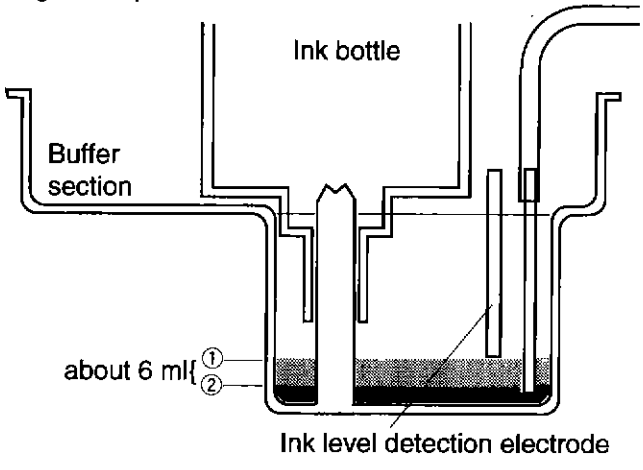

Figure 2-603

2. Mechanism

A trigger signal (INK_STA) is output from the engine controller PCB when the machine is turned on, the bubble jet cartridge is removed or attached and the printing is started or completed. Then after 2ms, the ink level is detected.

As shown in Table 2-601, according to the combination of the select signal 0 (INK_SEL0) and the select signal 1 (INK_SEL1), the select circuit selects the ink bottle where the ink level is detected. The ink level detection is performed in black, cyan blue, magenta and yellow inks in this order.

INK_SEL0	0	1	0	1
INK_SEL1	0	0	1	1
Color	Y	M	C	Bk

Table 2-601

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The select circuit in the ink detection circuit board outputs the 12V to the electrode in the selected ink bottle. When there is no ink between the two electrodes, the ink level detection signal (INK_SNS) output from the engine controller PCB from the select circuit through the relative circuit, changes from "1" to "0". This operation is performed 40 times and if the ink is not detected more than 20 times, "Tank is empty" is indicated.

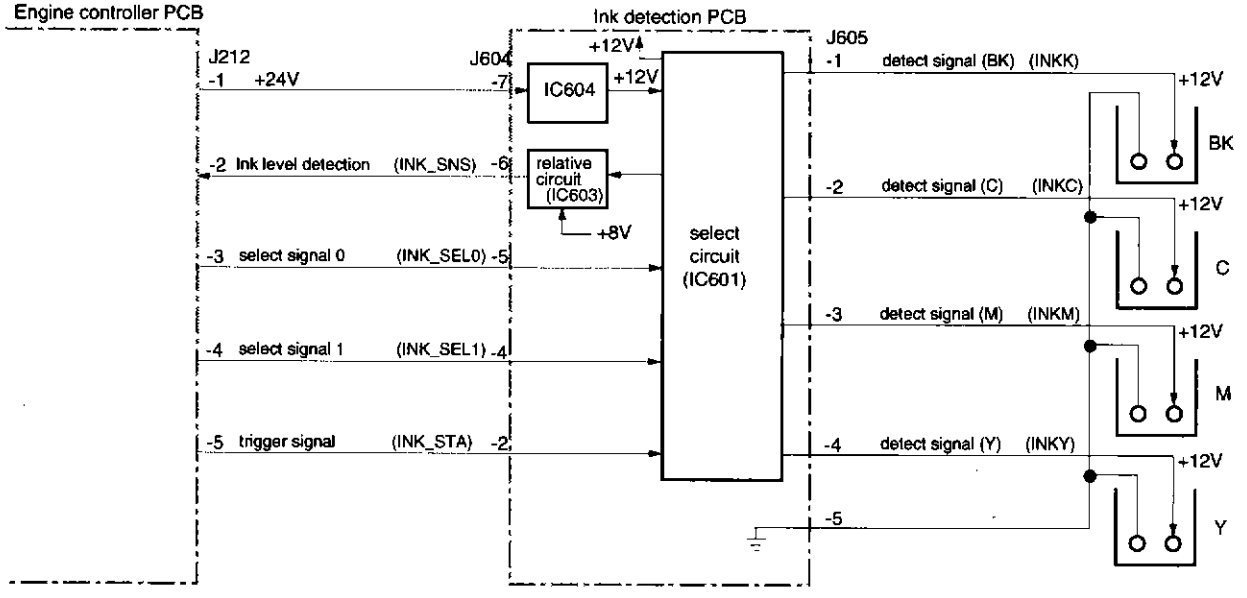

Figure 2-604

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VII. POWER SUPPLY

A. Outline

Figure 2-701 shows a block diagram of the various power supplies inside this printer.

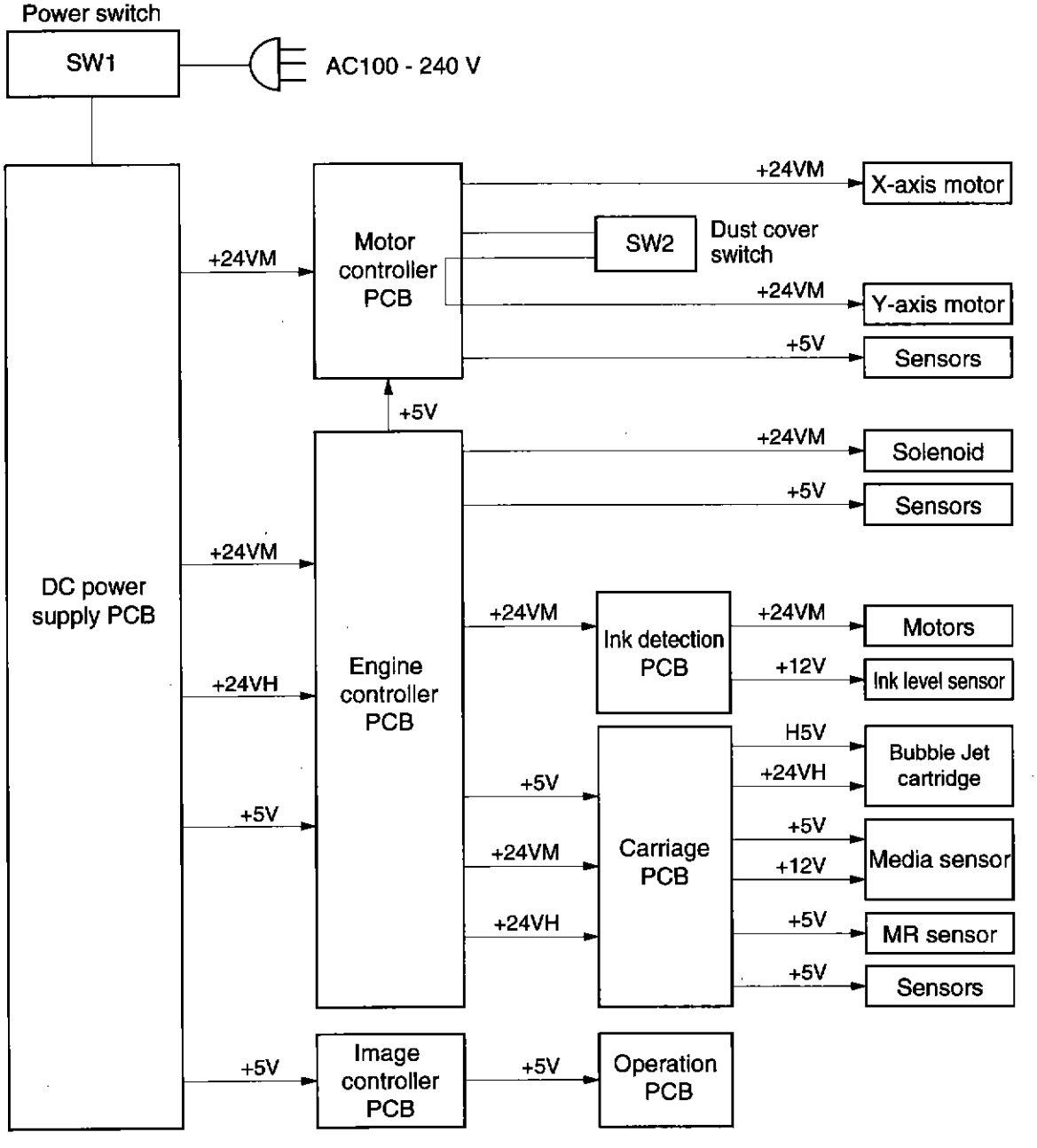

Figure 2-701

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B. Power Supply Circuit

AC power is supplied to the DC power supply PCB when the power switch is turned ON. The DC power supply PCB rectifies, steps down and smoothes the input AC power supply to generate +24V and +5V. +24V is for two power lines, VM for driving loads and VH for driving the head. In total, DC power is supplied to three power lines.

On the other hand, +24V (VH) input at the head relay PCB is stepped down to generate +12V.

Two power supplies, +24V (VH) for driving the head and +5V (H5V) for the HEAT signal, are output to the bubble jet cartridge. The output of these power supplies is controlled by the engine controller. Output is cut when the dust cover is opened, or when the carriage is moved to the cartridge replacement position. This is to prevent damage to the head and Carriage PCB by removal of the cartridge while electricity is supplied to the head.

In addition to the DC power supply, the engine controller PCB is provided with a RAM that has built-in battery and timer for saving various setups and backing up the dot count.

C. Power Circuit Protection Functions

The DC power supply PCB is provided with a fuse on its primary side, and overcurrent and overvoltage functions on its secondary side.

If something causes a load to become short-circuited, the protection functions stop all outputs from the DC power supply PCB.

When outputs are stopped, turn the power switch OFF, remove the cause that actuated the protection circuit and restore the power circuit. Then wait one minute before turning the power switch back ON again. This restores output.

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⚠ PRECAUTIONS DURING ASSEMBLY AND DISASSEMBLY

1. Before carrying out assembly and disassembly, be sure to disconnect the power cord and interface cable.
2. In principle, do not operate the printer with parts in a disassembled state.
3. Though the ink used on this printer is not harmful to the operator, it contains organic solvents. If ink should come into contact with your eyes, wash off thoroughly with running cold water, and consult a doctor.
4. Do not touch the aluminum plate on the bubble jet cartridge after plotting. This plate is hot. (Figure 3-001)
5. Do not loosen or remove screws that are not mentioned in the disassembly procedures in this manual
6. Assemble in the reverse order unless otherwise indicated.
7. When assembling, make sure that the correct screw types (length, diameter) are used at the correct location.
8. Sometimes the harness bands must be cut when handling a harness fastened by a harness band. When assembling, make sure that the harnesses are fastened by the harness band.
9. Ink mist generated during printing causes ink to adhere to the carriage or purge unit. Take care to prevent ink from transferring to your hands or clothes.
10. Before removing electrical PCBs, touch a properly earthed metal part to eliminate any static electricity in order to prevent damage to electronic devices by static electricity transferred from the body. Also, do not touch the terminals on the short flexible cable.
11. Handle bubble jet cartridges with care. (See page 1-16.)
12. When lifting the printer, lift up by the locations shown in Figure 3-002.
13. This printer's center of gravity is located at the front. Take care to prevent the printer from falling forwards when lowering from the stand.

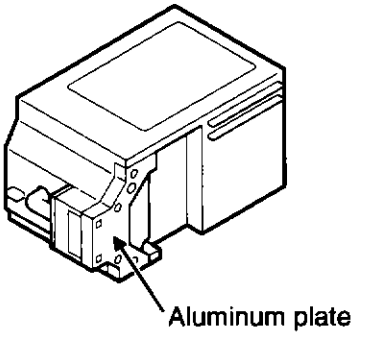

Figure 3-001

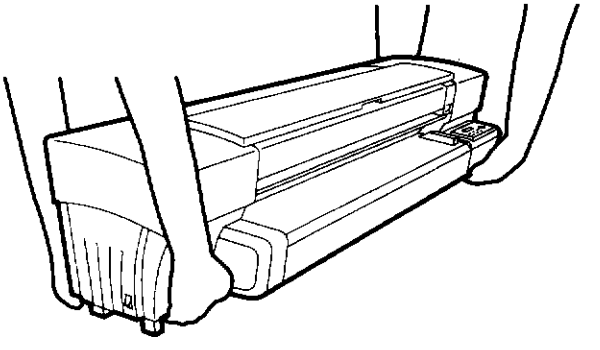

Figure 3-002

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I. EXTERNAL PARTS

A. Covers

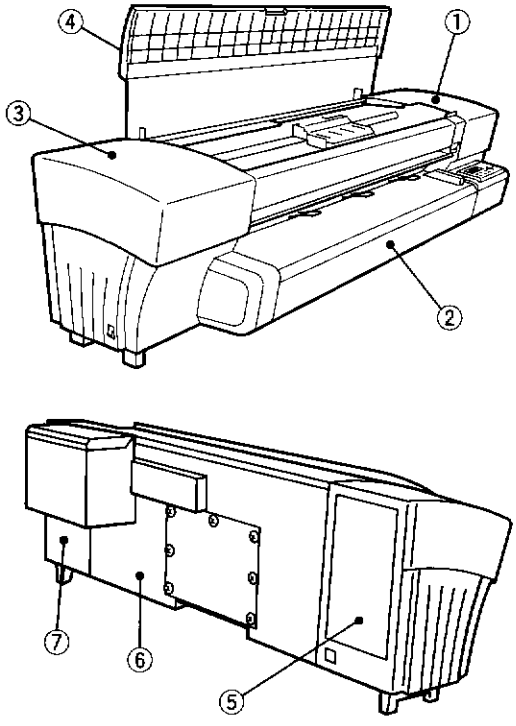

Figure 3-101

① Right cover (3)
② Roll media cover
③ Left cover (3)
④ Dust cover
⑤ Left rear cover
⑥ Rear cover
⑦ Right rear cover

Figures in parentheses show the number of machine screws to be used.

The removal procedures for the covers which can be removed easily and indipendently by removing their mounting screws are not included in this description.

CAUTION
When installing the right cover, make sure that the right cover secure the pre-discharge tank, as shown in Figure3-102.

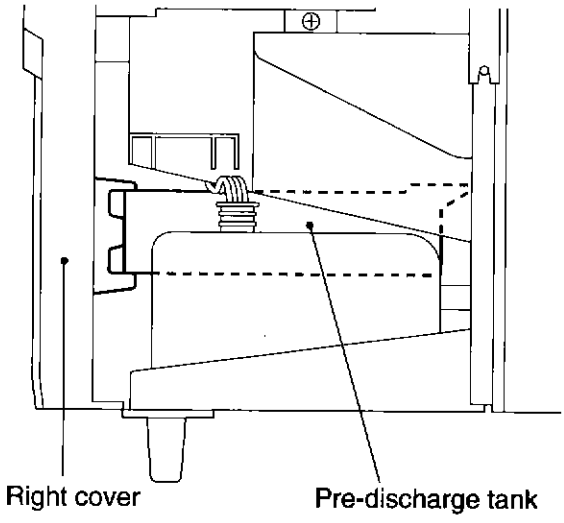

Figure 3-102

1. Removing the Rear Cover

CAUTION
Before starting the procedure make sure that the power cable is disconnected, since there are PCBs including the DC power PCB at the rear of the printer.

1) Remove the ink bottle case. (Refer to page 3-44).
2) Remove the three mounting screws ① and remove the tank holder ②.

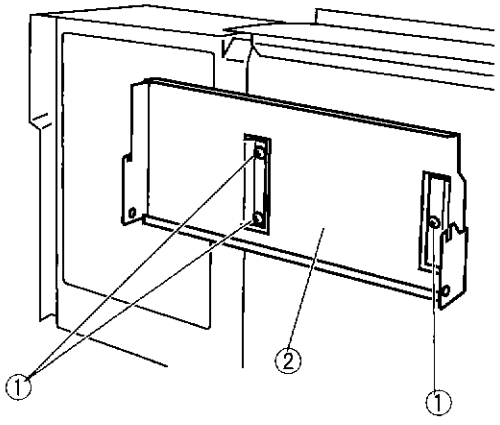

Figure 3-103

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3) Remove the three mounting screws ③ and disconnect the relay connector ④ at the side of the PCB. Then remove the rear cover ⑤.

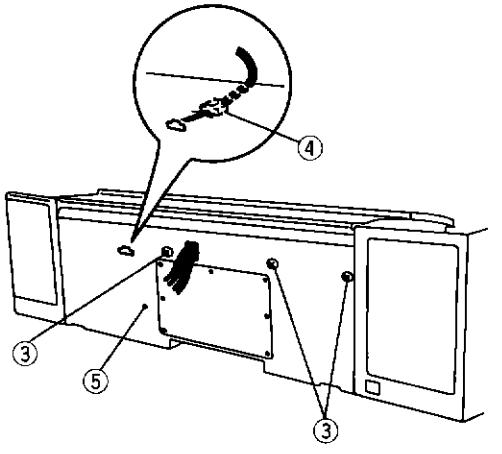

Figure 3-104

2. Removing the Left Rear Cover

1) Remove the rear cover .
2) Remove 3 mounting screws ① and remove left rear cover ②.

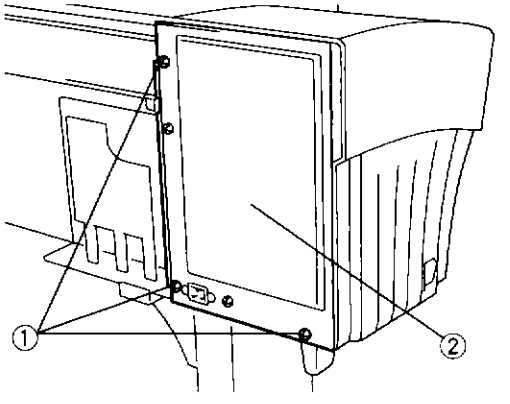

Figure 3-105

3. Removing the Right Rear Cover

1) Remove the rear cover.
2) Remove 3 mounting screws ① and remove right rear cover ②.

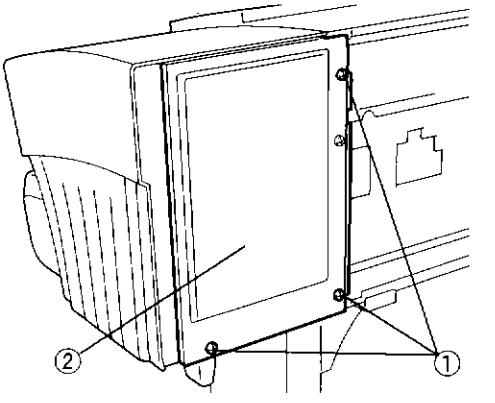

Figure 3-106

4. Removing the Dust Cover

1) Remove the left, right, rear, left rear and right rear covers.
2) Remove the three mounting screws ① and remove the dust cover unit ②.

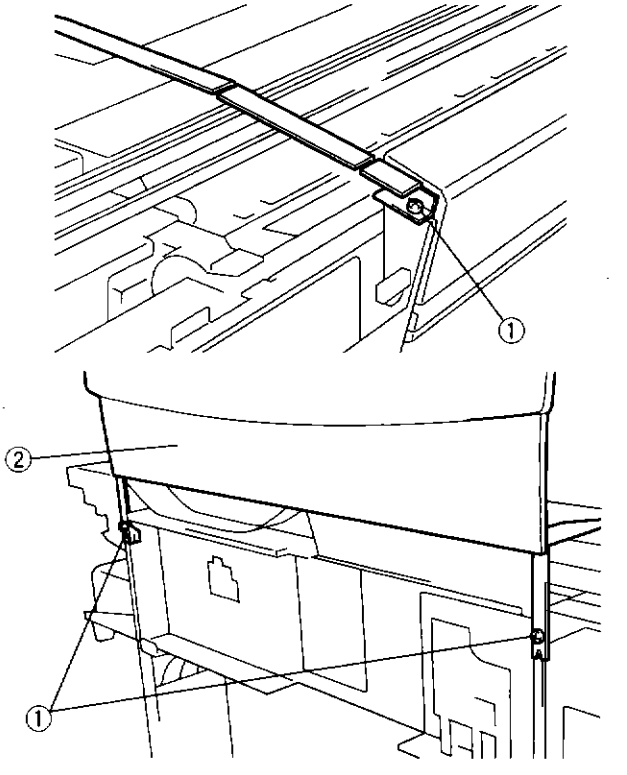

Figure 3-107

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5. Removing the Roll Media Cover

1) Open roll media cover.
2) Remove mounting screw ① and remove support plate (one each on left and right) ②.

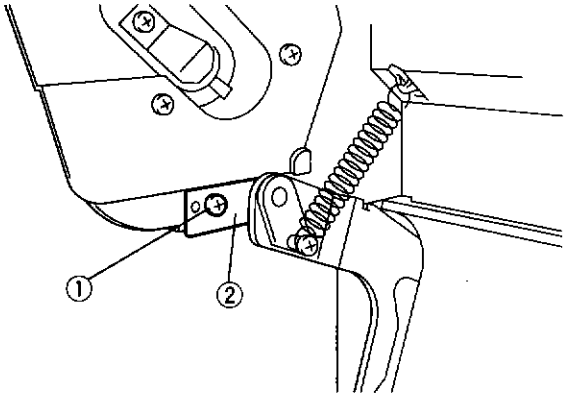

Figure 3-108

3) Move left and right cover pins ③ from notch ④ on front side to notch ⑤ on rear side. Remove tension springs (one each on left and right) ⑥ and remove roll media cover ⑦.

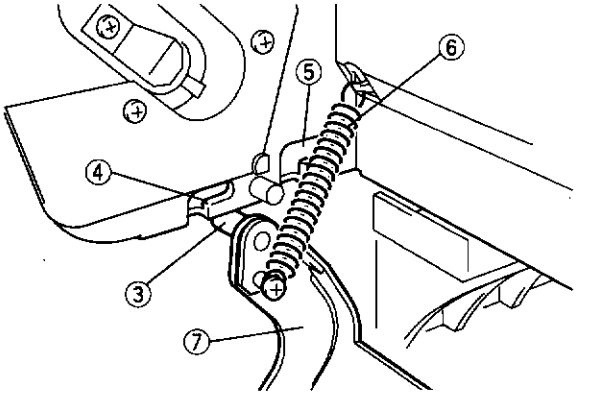

Figure 3-109

CAUTION
These tension springs exhibit strong force. Take sufficient care when removing these tension springs.

CAUTION
When installing the support plate, attach it as shown in figure 3-110.

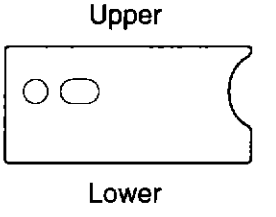

Figure 3-110

6. Removing the Dust Cover Open/ Close Detection Switch/Dust Cover Switch

1) Remove the left and right covers.
2) Remove 4 mounting screws ① and remove media discharge lower guide ②.

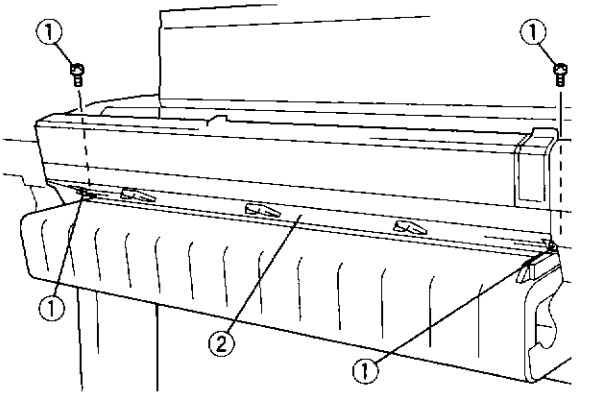

Figure 3-111

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3) Remove 4 mounting screws ③ and remove media discharge upper guide ④.

CAUTION
Before you open the media discharge release lever, move the carriage to the right end of the body.

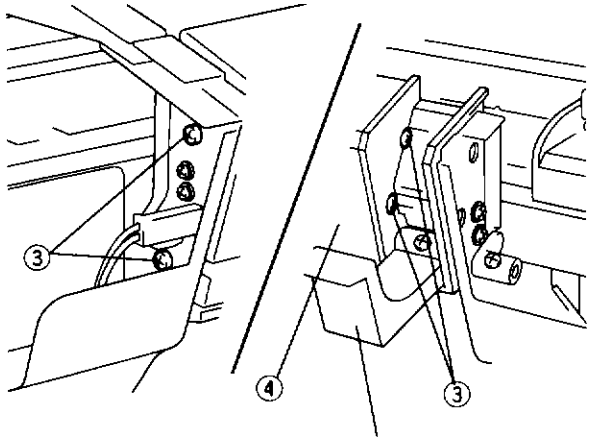

Figure 3-112

4) Remove 2 mounting screws ⑤ and remove switch holder ⑥.

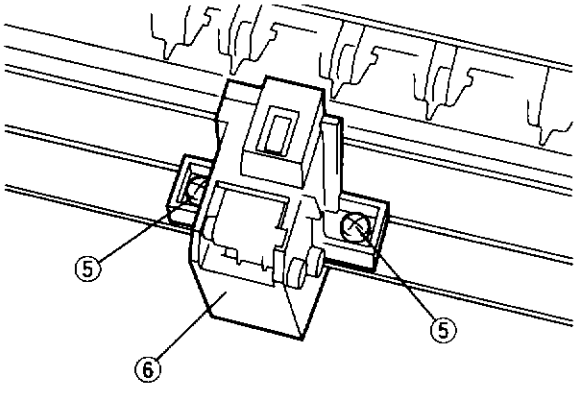

Figure 3-113

5) Remove 2 mounting screws ⑦. Remove dust cover open/close detection switch ⑧ and dust cover switch ⑨.

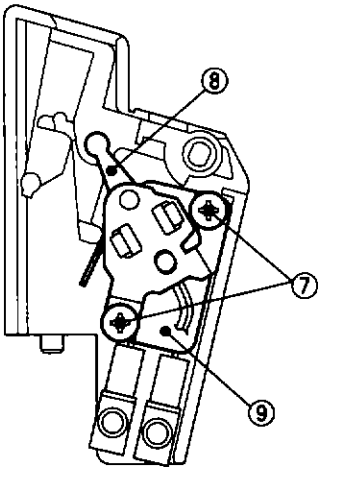

Figure 3-114

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B. Control Panel

1. Removing the Control Panel

1) Remove the right cover.
2) Disconnect connector ① from the control panel PCB.
   Remove 2 mounting screws ② and remove control panel ③.

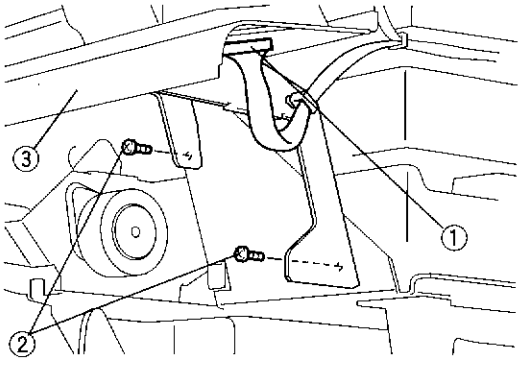

Figure 3-115

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II. CARRIAGE

1. How to Cancel the Capping for the Purging Unit

There are two ways for cancelling the capping for the purge unit.

a) Open the dust cover while the printer is in stand-by mode.

b) Turn the driving gear of the purge unit counterclockwise manually while the power of the unit is in OFF mode. In this case, stop turning the gear when the four absorbers in the purging unit are lowered by visual observation.

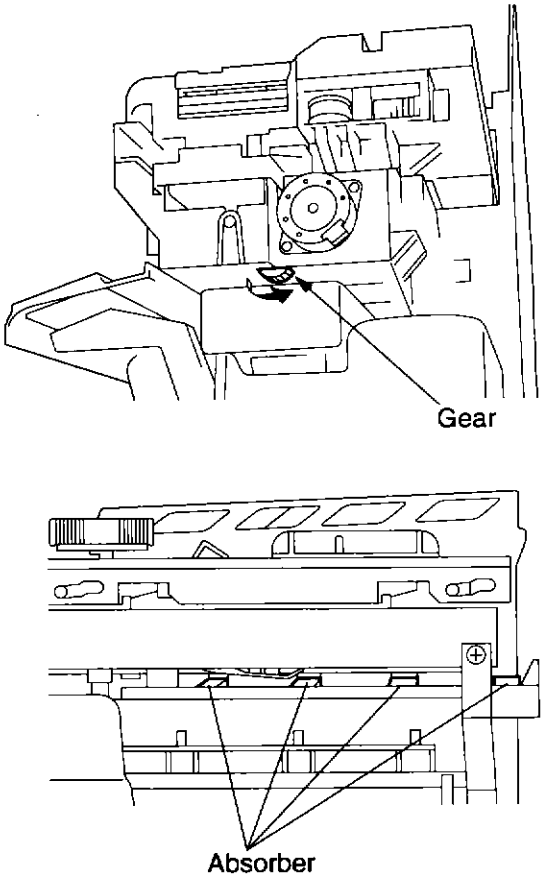

Figure 3-201

2. Removing the Cover Caterpillar Unit

1) Remove the left, right, rear and right rear covers.
2) Remove the head joint ① from the cartridge and place it on the joint stand.
3) Open the tube cock ② and return the ink in the tube to the buffer section.

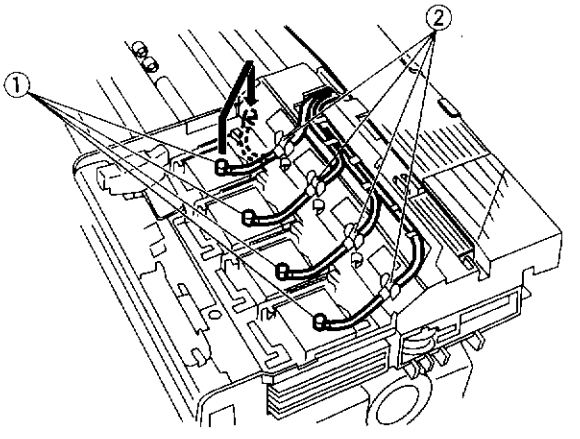

Figure 3-202

4) Remove the two mounting screws ③ and remove the protection sheet ④.

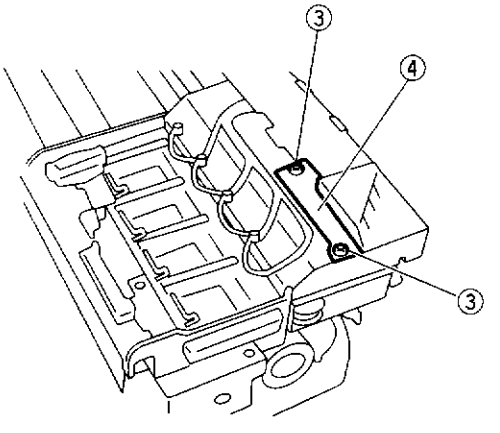

Figure 3-203

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5) Release the five hooks ⑤ with a screwdriver and remove the carriage cover ⑥. Then disconnect the connector (J405) ⑦ of the long flexible cable on the head relay PCB and remove the long flexible cable ⑧ from the carriage cover.

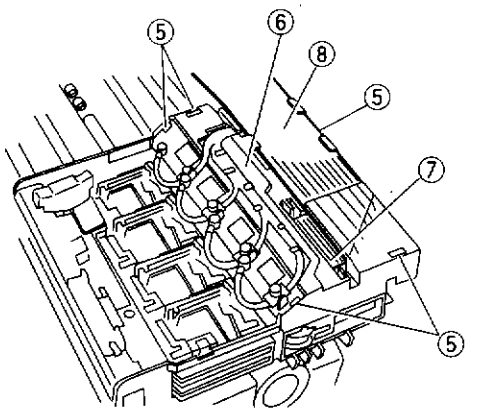

Figure 3-204

6) Remove the flexible mylar ⑨ from the carriage cover.

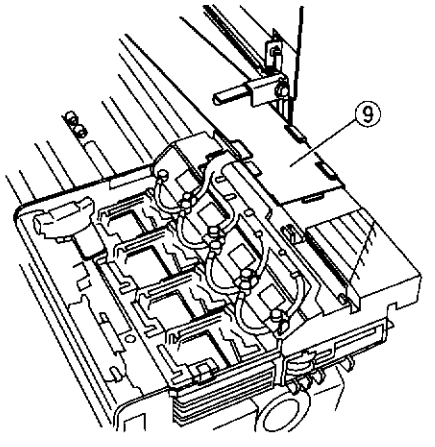

Figure 3-205

CAUTION
Take care not to damage the flexible mylar.

7) Arrange the long flexible cable and the flexible mylar which have been removed from the carriage cover, to hang down from the left side of the printer.

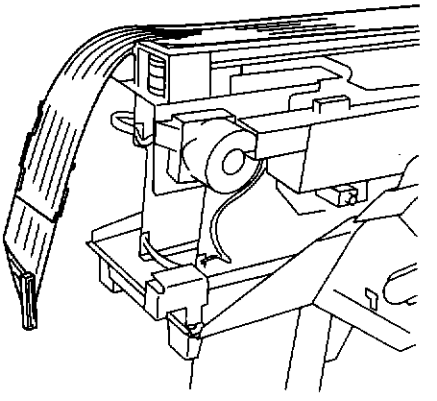

Figure 3-206

8) Remove the tube ⑩ from the long flexible cable retainer.

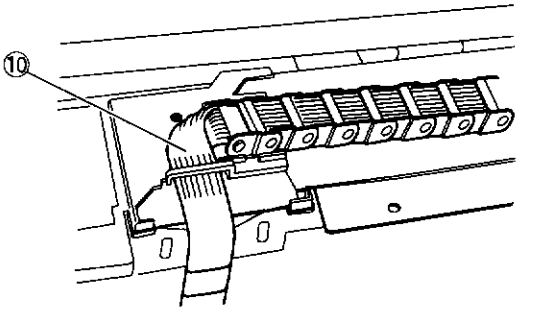

Figure 3-207

CAUTION
When the tube is installed, align the marking position of the tube with the long flexible retainer.

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9) Release the hook ⑪ and remove the caterpillar ⑫ from the long flexible cable retainer. Then remove the cover caterpillar unit.

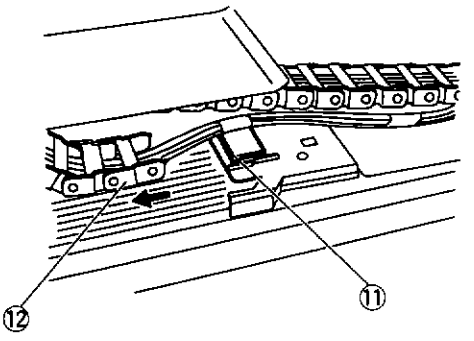

Figure 3-208

3. Precaution in handing the Linear Encoder

Keep the magnetic screwdriver well away from the memory wire.

- When the memory wire is removed, don't let it touch any metal surface.Make sure that there are no breakages, scratches or dirt on the memory wire.
- Take the greatest possible care not to touch the surface of the memory wire.
- Store the removed linear encoder while avoiding magnetism.

4. Removing the Linear Encoder

1) Remove the cover caterpillar unit. (Refer to page 3-7).
2) Manually move the carriage to the right end of the platen.

3) Remove the wire guard ① from the right hook.

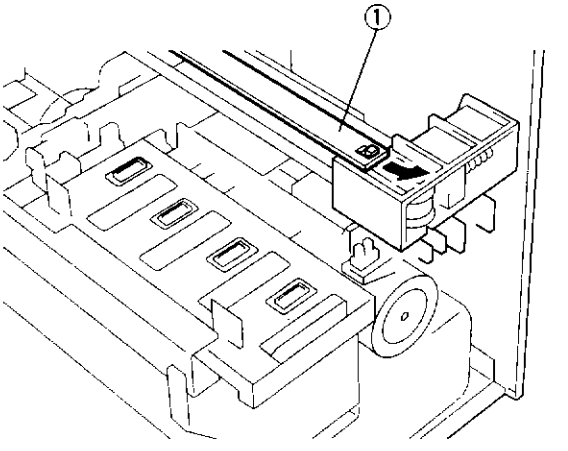

Figure 3-209

4) Remove the spring ② and the wire guard ③ from the left side of the printer.

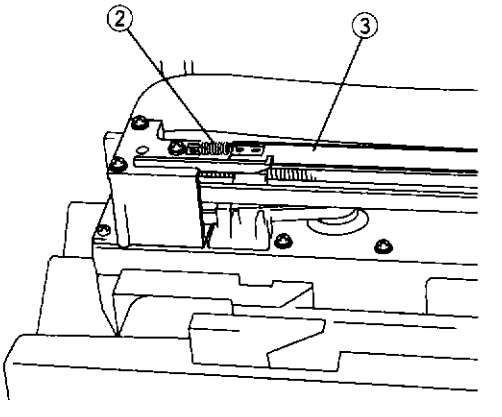

Figure 3-210

5) Remove the mounting screw ④ and remove the cutter guide ⑤.

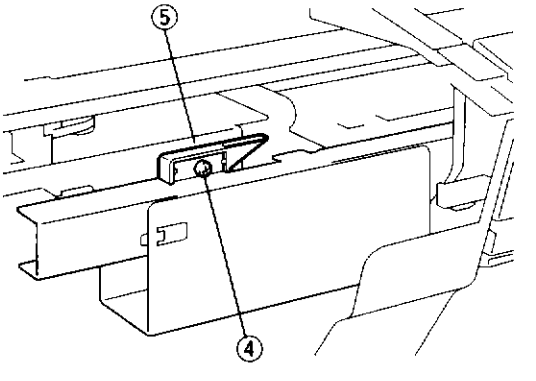

Figure 3-211

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6) Slowly move the carriage manually until it reaches the left end.

CAUTION
Be sure to carry this out to prevent screws from falling and to protect the memory wire.

7) Disconnect the short flexible cable (C) (J402) ⑥ from the carriage PCB and disconnect the ribbon cable (J409) ⑦ from the MR sensor.
8) Remove the two mounting screws ⑧ from the MR sensor.

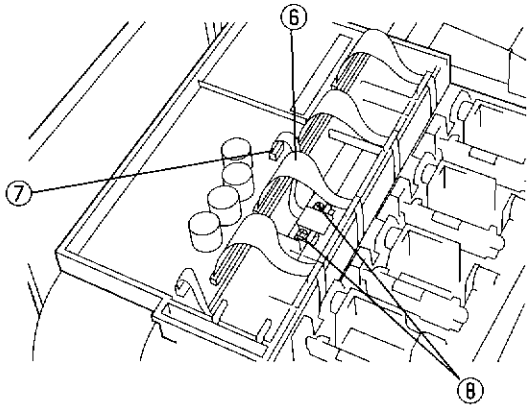

Figure 3-212

CAUTION
When a magnetic screwdriver is used, take care not to let it come close to the memory wire.

9) Move the carriage to the right end of the platen manually.

10) Remove the tension stopper ⑨, turning it clockwise and remove the tension spring ⑩ and the tension lever ⑪.

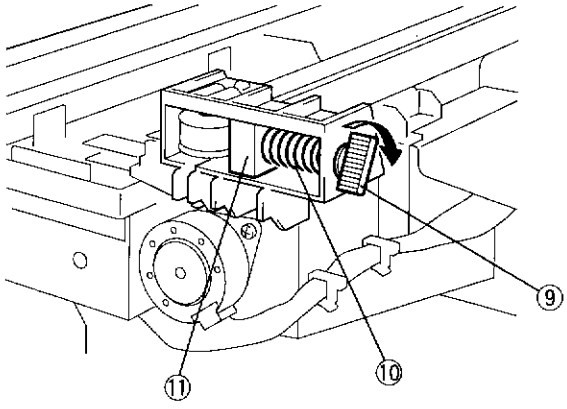

Figure 3-213

11) Release hooks and remove the carriage home position sensor ⑫.
12) Remove the two mounting screws ⑬ on the right pulley mount.

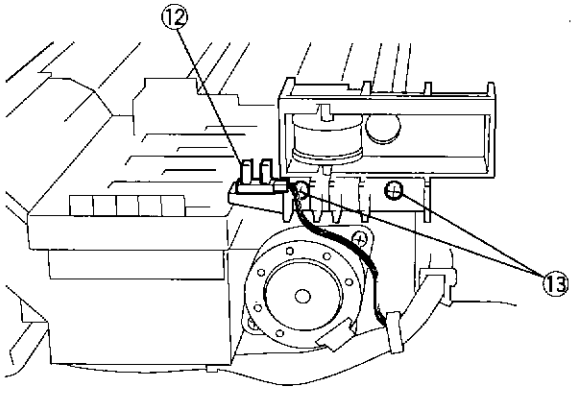

Figure 3-214

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13) Remove the right pulley mount ⑭, pulley (right) ⑮ and pulley tensioner ⑯.

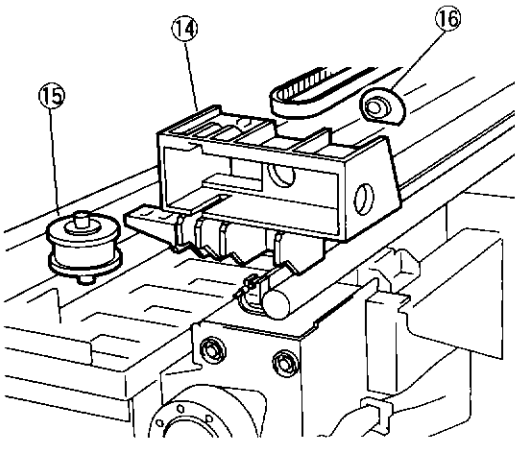

Figure 3-215

CAUTION
When the right pulley plate is removed, take care not to lost the pulley tensioner ⑯.

14) Remove the two mounting screws ⑰ from the right side of the printer and remove the memory wire installation mount (right) ⑱.

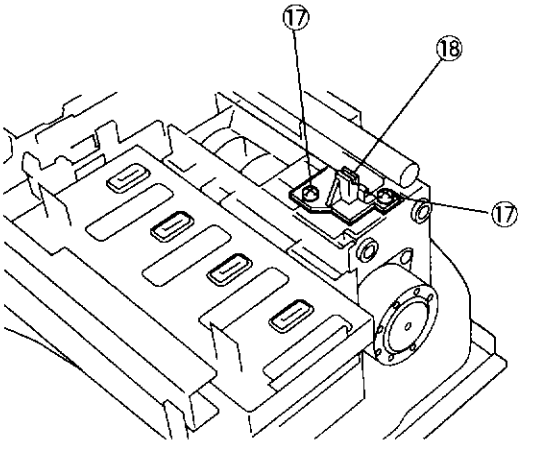

Figure 3-216

CAUTION
When a magnetic screwdriver is used, take care not to let it come close to the memory wire.

15) Remove the three mounting screws ⑲ and remove the pulley cover ⑳.

16) While pressing the earth plate (left) ㉑ lightly to the other side, remove the linear encoder ㉒ from the left side of the printer.

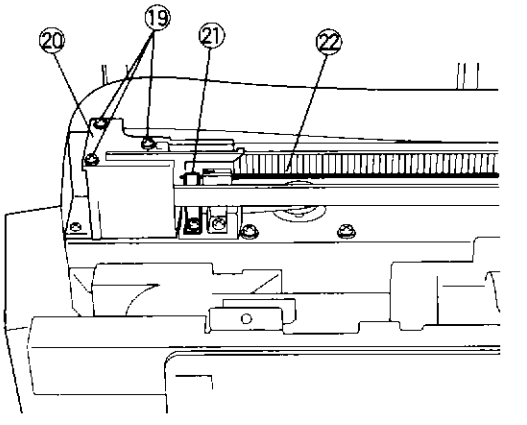

Figure 3-217

CAUTION
- Take the greatest care to handle the linear encoder. (Refer to page 3-9).
- Install the linear encoder so that the flat surface of the memory wire edge is set to be upward. Make sure that the spring and the washer are included in the memory wire fixing plate (left).
- After the linear encoder has been installed, adjust the tension of the carriage driving belt. (Refer to page 5-4).

CAUTION
When the pulley (right) is installed, the side with a mark should be set to be upward.

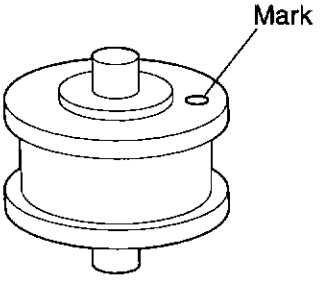

Figure 3-218

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5. Removing the Carriage Unit

1) Remove the Y cutter.
2) Remove the linear encoder. (See page 3-9.)
3) Remove Y-axis motor. (See page 3-40.)
4) Remove tension screw ① and washer ②.
5) Remove 3 screws ③ to remove pulley cover ④, and remove carriage drive belt ⑤ from the left pulley mount ⑥.

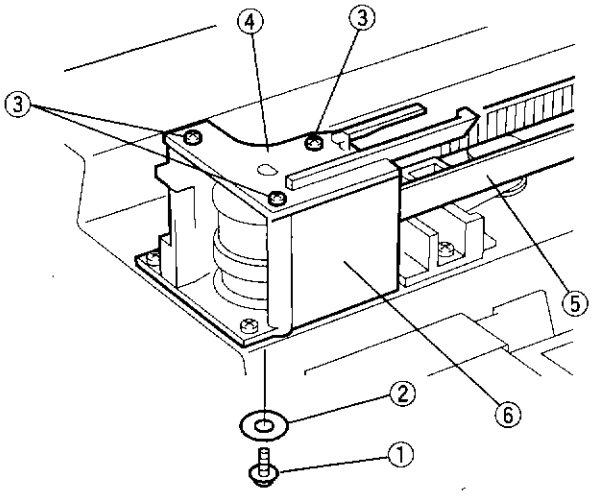

Figure 3-219

6) Remove screw ⑦ and remove earth plate (left) ⑧.
7) Remove 5 screws ⑨ and remove memory wire installation mount (left) ⑩ and left pulley mount ⑪.

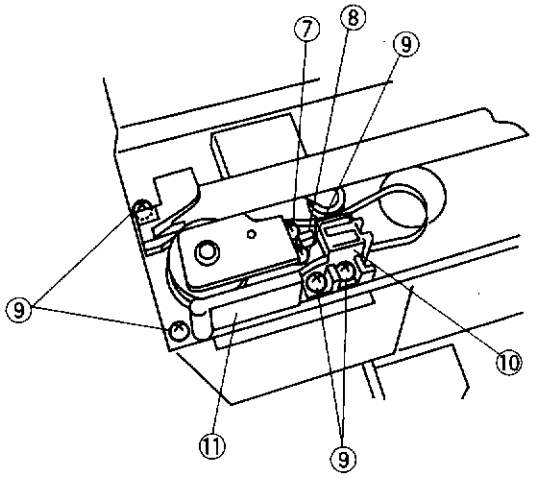

Figure 3-220

8) Remove carriage unit ⑫ from the left of the printer.

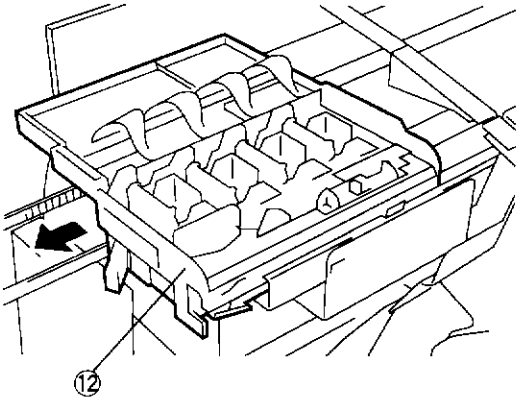

Figure 3-221

CAUTION

- When the carriage unit is removed, take care not to let the driving belt touch any component on the platen.
- Don't hold paper sensors at the bottom and left side of the carriage unit by hand.
- When the carriage unit is installed in the printer, press down the carriage roller under the cutter rail as shown in Figure 3-222.
- After the carriage is installed, adjust the tension of the carriage driving belt. (Refer to page 5-4).
- After the carriage has been installed, adjust the gain and light intensity of the media sensor.(Refer to pages 5-7 and 5-8).

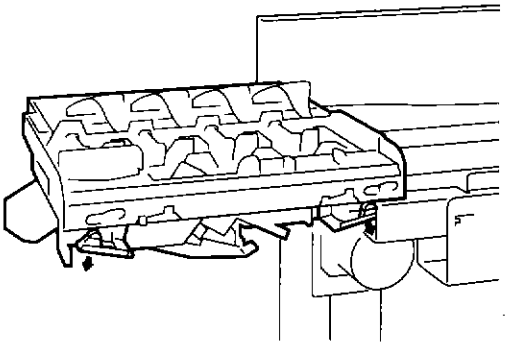

Figure 3-222

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6. Removing the Cartridge Holder

1) Remove the carriage unit.
2) Turn the cartridge fixing knob to FREE.
3) Remove 3 mounting screws ① and remove cartridge fixing knob ②.

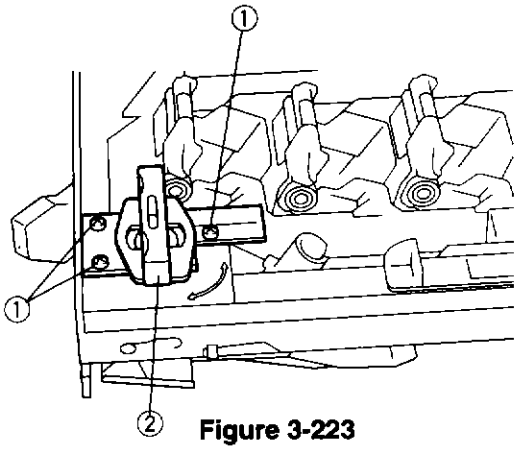


Figure 3-223

4) Remove spring ③ and gear ④.

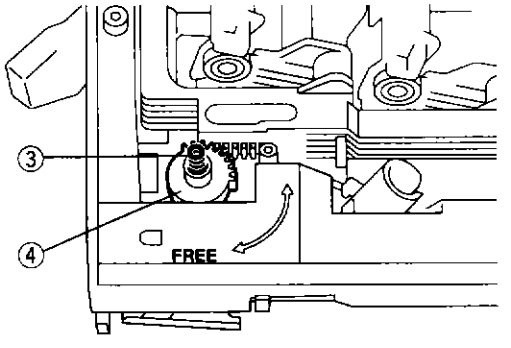


Figure 3-224

5) Turn the carriage over.
Remove 4 mounting screws ⑤ and remove wiper retainer ⑥.
Remove 3 mounting screws ⑦ and remove 3 media retainers ⑧.

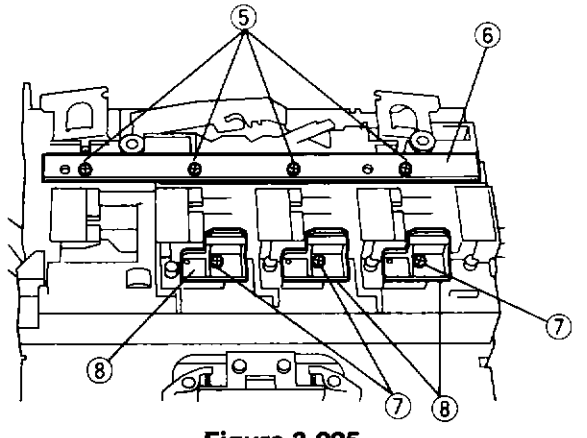
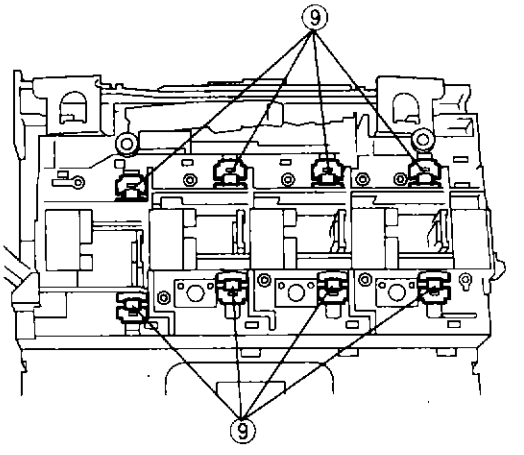
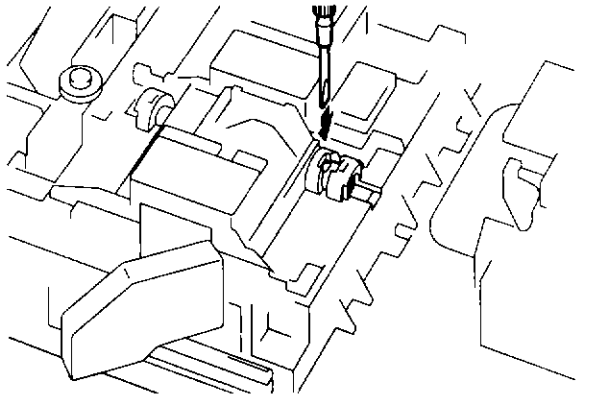


Figure 3-225

6) Release 8 cartridge holder pins (white) ⑨ with a flat-head screwdriver to remove.





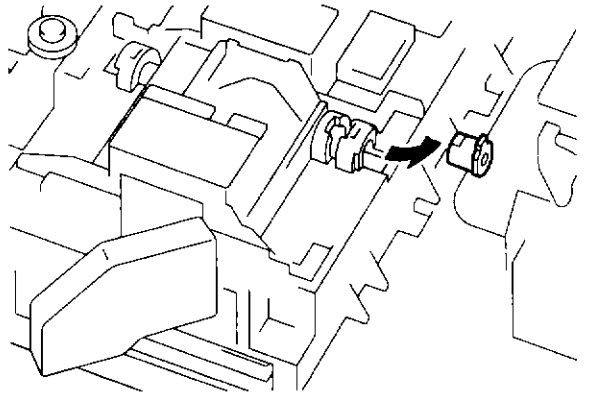


Figure 3-226

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7) Remove cartridge holder ⑩.

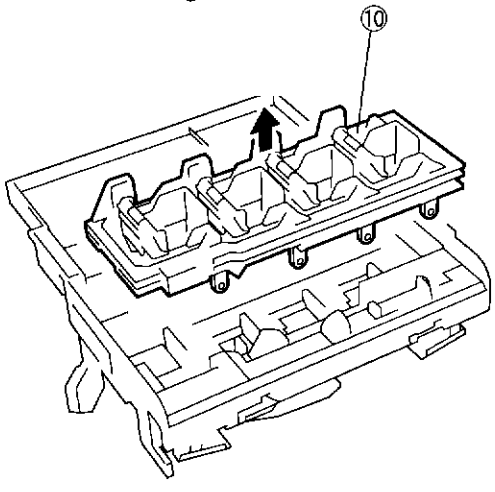

Figure 3-227

CAUTION
When installing the cartridge holder, install so that the cartridge holder is at the position shown in Figure 3-228.

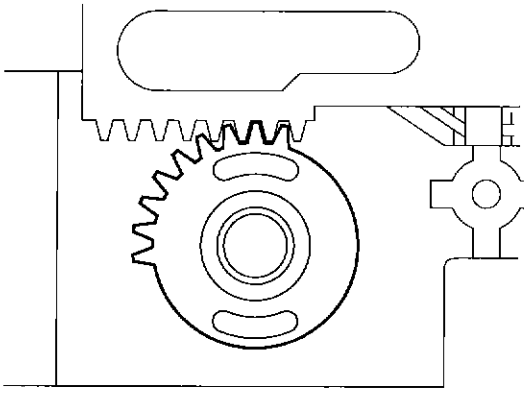

Figure 3-228

7. Removing the Short Flexible Cable

1) Remove the carriage unit.
2) Remove the cartridge holder.
3) Disconnect short flexible cable connector ① from the carriage PCB.
4) Remove 2 mounting screws ② and remove flexible cable retainer ③.
5) Remove the short flexible cable.

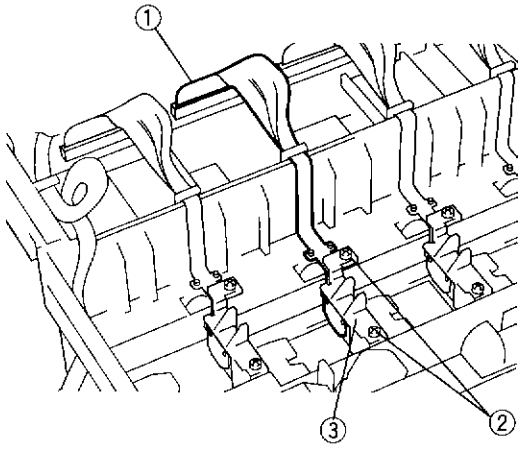

Figure 3-229

8. Replacing the Short Flexible Cable

1) Bend the new short flexible cable as shown in Figure 3-230 and install to the carriage.

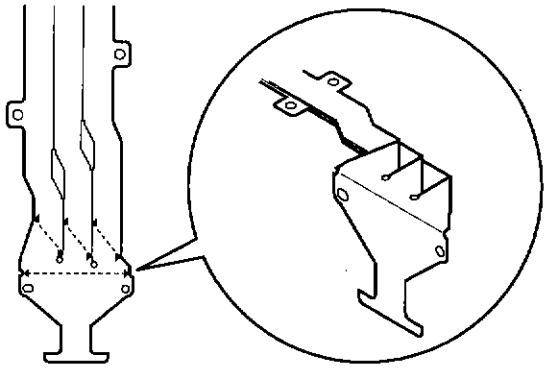

Figure 3-230

CAUTION
When bending the short flexible cable, take care to prevent the cable from becoming scratched or cut.

2) After replacing the short flexible cable, wipe the electrodes on the short flexible cable with alcohol to clean.

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9. Removing the Volume PCB

1) Remove the carriage unit.
2) Remove the cartridge holder.
3) Set the cartridge height adjustment lever to the center position.
4) Remove screw ① and remove the volume PCB ②.

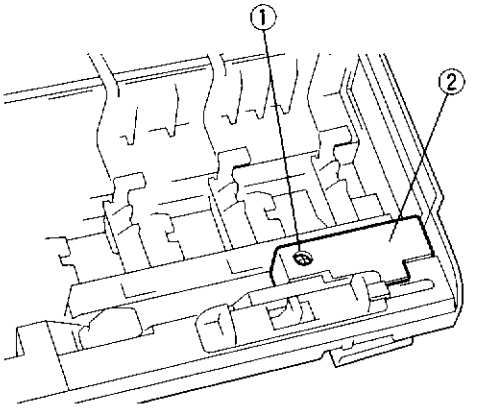

Figure 3-231

CAUTION

When installing the volume PCB, make sure that the volume PCB is installed with the knob on the volume PCB inserted in the groove of the cartridge height adjustment lever.

10. Removing the Cutter Unit

1) Remove the carriage unit.
2) Remove spring ① and remove cutter unit ②.

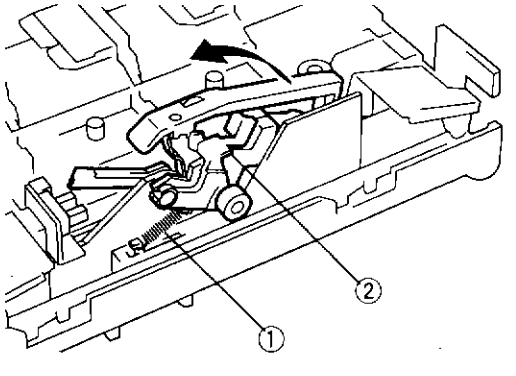

Figure 3-232

11. Removing the Cutter Sensor

1) Remove the carriage unit.
2) Set the cartridge height adjustment lever to the center position.
3) Remove screw ① and remove volume PCB ②.

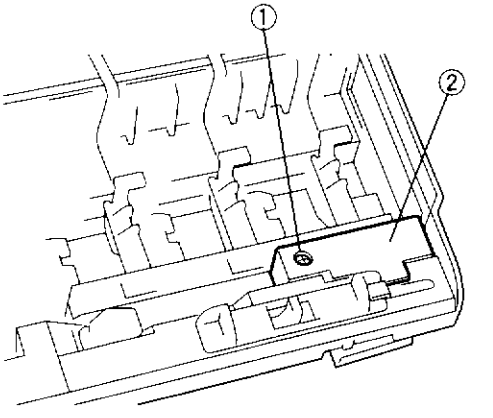

Figure 3-233

4) Remove mounting screw ③ and remove cutter sensor ④.

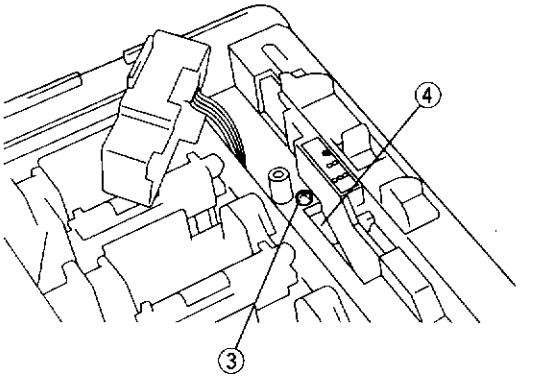

Figure 3-234

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12. Removing the Cartridge Lock Detection Sensor

1) Remove the carriage unit.
2) Remove the cartridge holder.
3) Set the cartridge height adjustment lever to the center position.
4) Remove screw ① and remove volume PCB ②.

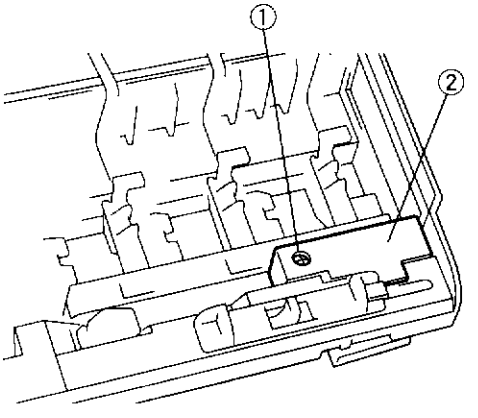

Figure 3-235

5) Release the hooks of the sensor mount ③.

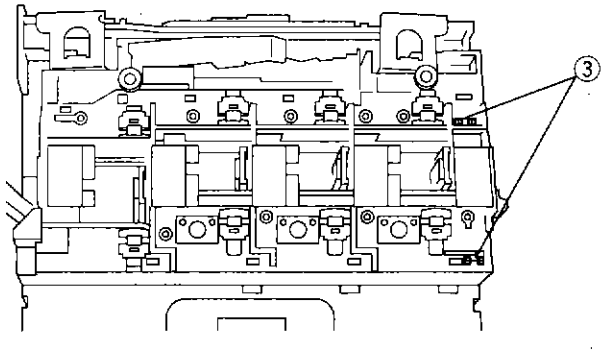

Figure 3-236

6) Release the hook, and remove cartridge lock detection sensor ④.

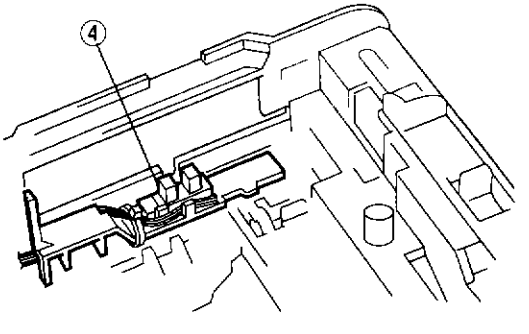

Figure 3-237

13. Removing the Media Illumination Lamp

1) Remove the left and right covers.
2) De-cap the purge unit.
3) Remove the Y cutter.
4) Gently move the carriage by hand until it comes up against the left end of the printer.
5) Release 3 hooks ① and remove lamp cover ②.

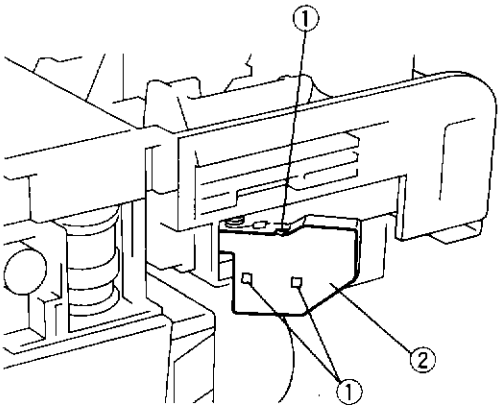

Figure 3-238

CAUTION
Take care to prevent the infrared and blue filters and lens in the media sensor from falling.

6) Disconnect connector ③ and remove media illumination lamp ④.

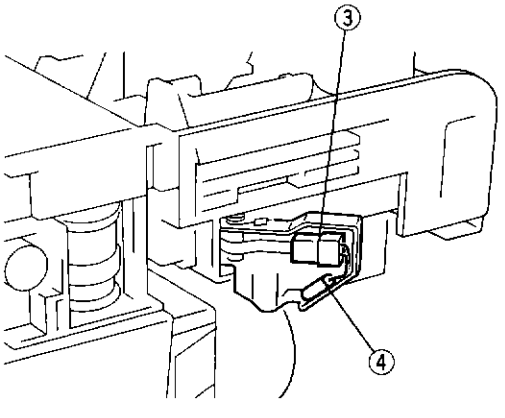

Figure 3-239

CAUTION
After the media illumination lamp has been installed, adjust media illumination lamp optical axis. (Refer to page 5-2).

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14. Removing the Media Sensor

1) Remove the carriage unit.
2) Remove the cartridge holder.
3) Disconnect connector (J408) ① from the carriage PCB and remove ribbon cable (J410) ②.
4) Draw out sensor installation shaft ③ and remove media sensor ④.

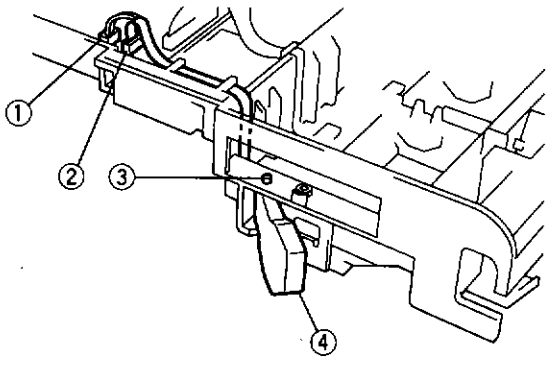
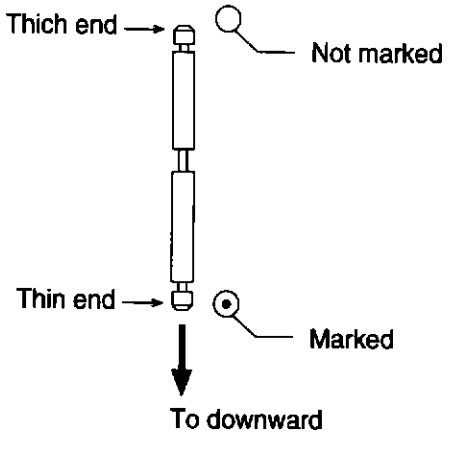


Figure 3-240

CAUTION

- When the media sensor has been installed, make sure that it moves smoothly.
- When the mediar sensor is replaced, adjust the optical axis of the lamp and gain and light intensity of the media sensor. (Refer to pages 5-2, 5-7 and 5-8).
- Insert sensor mounting shaft ③ in the direction shown below.



15. Removing the Carriage PCB

1) Remove the cover caterpillar unit. (Refer to page 3-7).
2) Disconnect all the connectors on the carriage PCB.
3) Remove the four mounting screws ① and remove the carriage PCB.

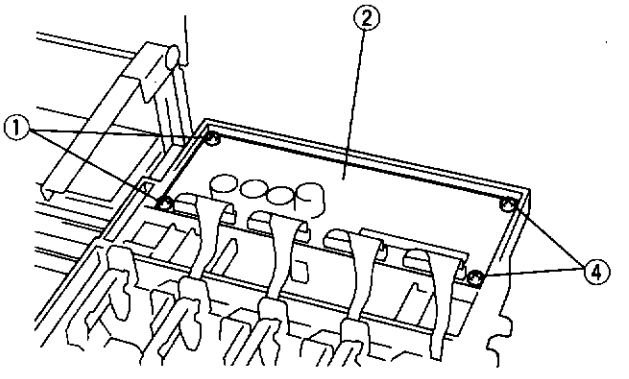


Figure 3-241

CAUTION

When the carriage PCB is replaced, adjust the gain and light intensity of the media sensor. (Refer to pages 5-7 and 5-8).

16. Removing the Long Flexible Cable

1) Remove the cover caterpillar unit (Refer to page 3-7).
2) Remove the two mounting screws ① and disconnect the connector(J206) ② on the engine controller PCB.
3) Release the hook at the rear of the printer and remove the long flexible cable retainer ③. Then remove the long flexible cable unit ④.

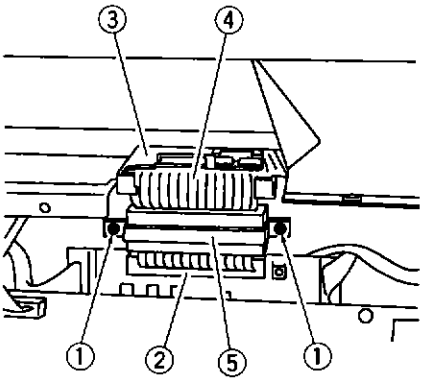


Figure 3-242

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CAUTION
- Take care not to drop the ferrite core ⑤.
- Take care to keep the ferrite core ⑤ away from the memory wire.

17. Replacing the Long Flexible Cable

Bend the new long flexible cable at a right angle as shown in Figure 3-243, and install to the printer.

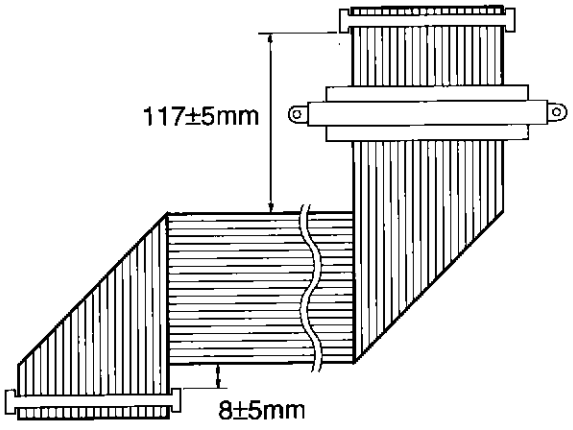

Figure 3-243

18. Removing the Media Retainer Solenoid

1) Remove the left cover.
2) Remove 2-pin relay connector ① and mounting screw ② then remove media retainer solenoid ③.

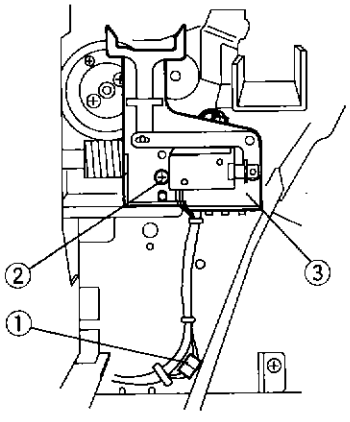

Figure 3-244

19. Removing the Media Retainer Unit

1) Remove the left cover.
2) Remove a screw ① and remove cutter cover ②.

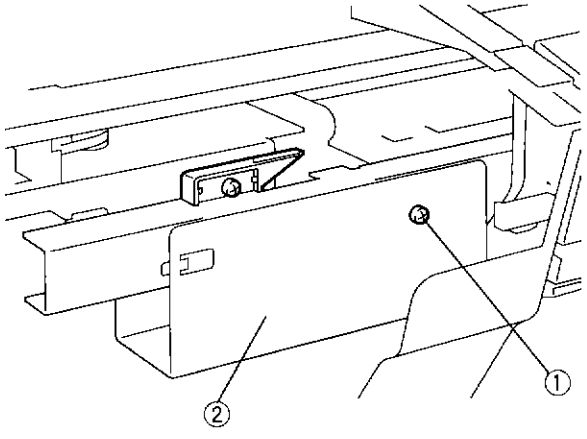

Figure 3-245

3) Release the hook to remove media retainer detection switch ③.

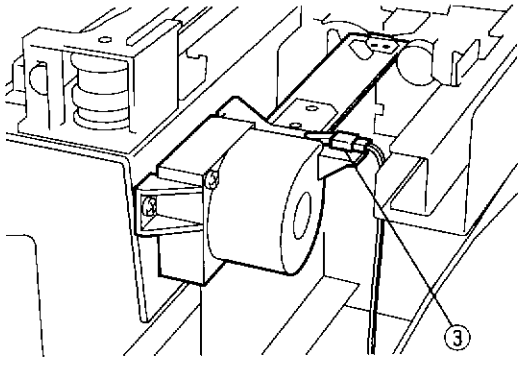

Figure 3-246

4) Remove 3 mounting screws ④ and remove media retainer unit ⑤.

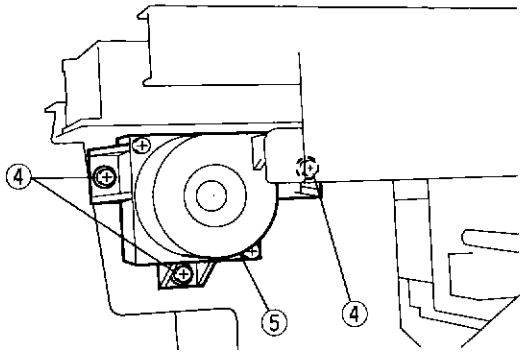

Figure 3-247

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20. Removing the Cover Tubes

The procedure is exactly the same for all four cover tubes. In this description, the example of cover tube (Bk) is taken to explain the procedure.

1) Remove the right and right rear covers.
2) Remove the head joint ① from the cartridge and insert it in the joint stand.
3) Open the tube cock ② and return the ink in the tube to the buffer section.

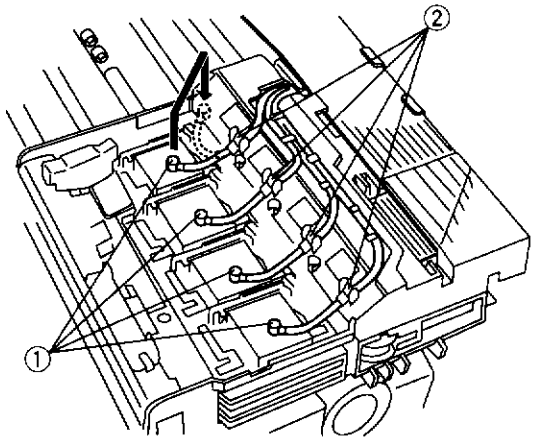

Figure 3-248

4) Remove the two mounting screws ③ and remove the protection sheet ④.

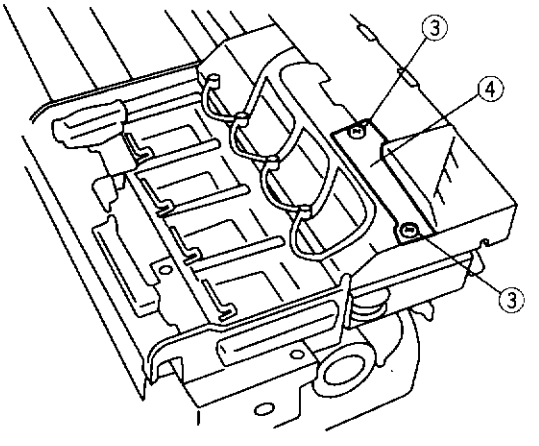

Figure 3-249

5) Release the five hooks ⑤ using a screwdriver and remove the carriage cover ⑥. Then disconnect the connector (J405) ⑦ of the long flexible cable on the head relay PCB and disconnect the long flexible cable ⑧ from the carriage cover.

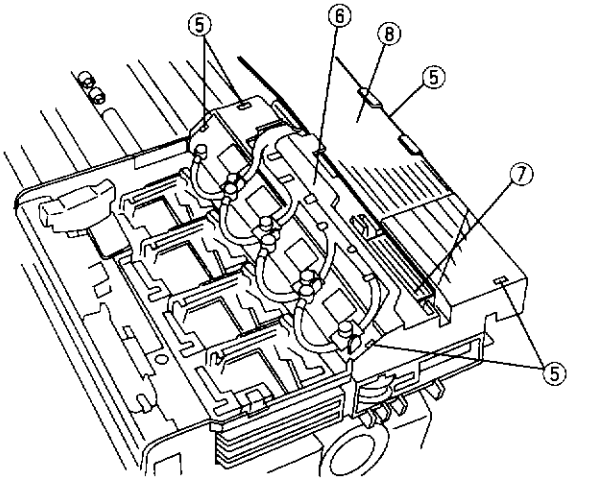

Figure 3-250

6) Remove the flexible mylar ⑨ from the carriage cover.

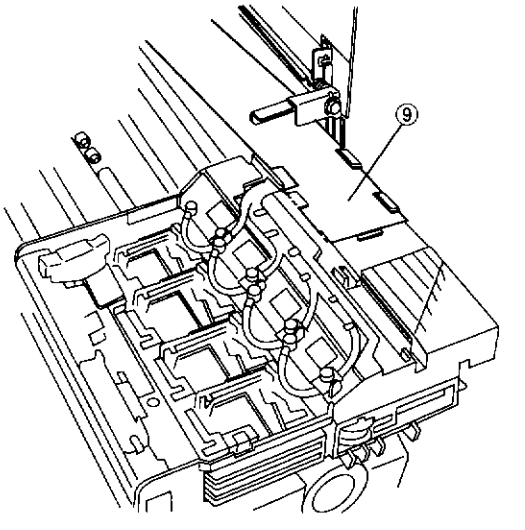

Figure 3-251

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7) Release the two hooks ⑩ and remove the caterpillar ⑪ from the carriage cover.

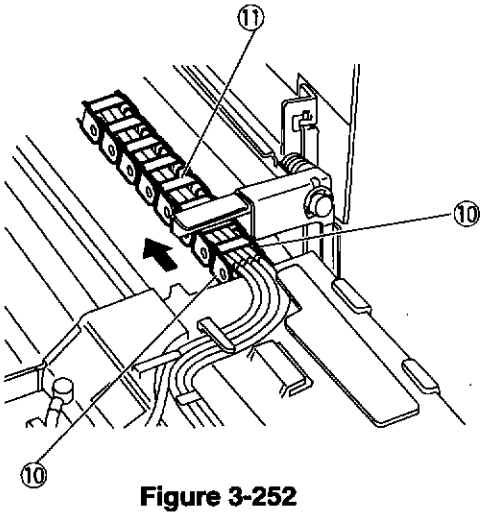

Figure 3-252

8) Remove the tube joint ⑫ from the head joint ⑬ and remove the cover tube (Bk).

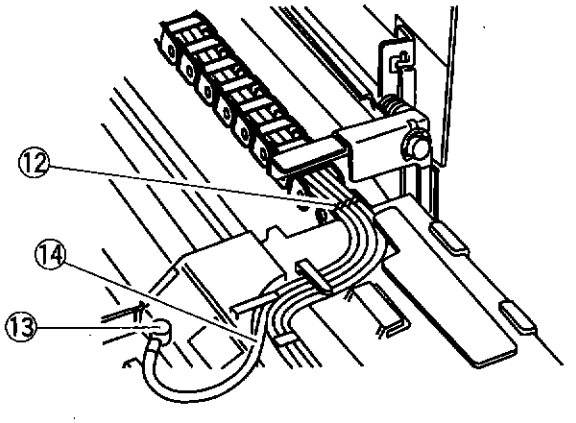

Figure 3-253

21. Installing Position for the Cover Tube

Install the cover tube following the instructions below.

- Arrange the marked ① side towards the side of the caterpillar.
- Install the cover tube so that the mark ① of the cover tube is aligned with the position A.
- Since each colored cover tube has a different length, don't make any mistake about the installing position for each colored tube.
- Put the tube onto the joint so that the tube reaches the end of the joint.

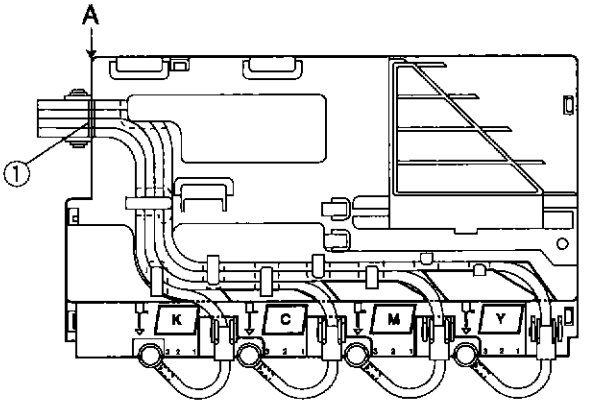

Figure 3-254

22. Removing the Ink Supply Tube

1) Remove the cover caterpillar unit. (Refer to page 3-7).
2) Release the two hooks ① and remove the caterpillar ② from the carriage cover.

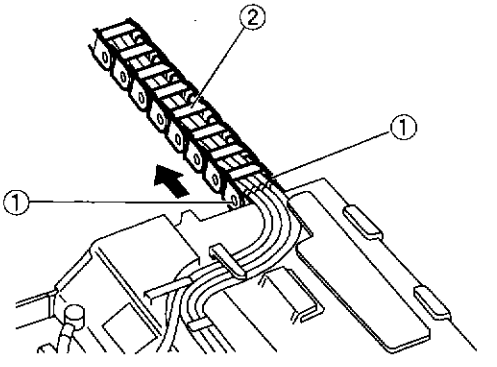

Figure 3-255

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3) Remove the tube joint and then remove the ink supply tube ④ from the tube joint ③.

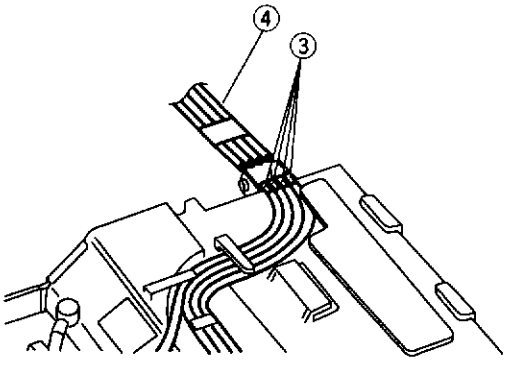

Figure 3-256

23. Installing Position of the Ink Supply Tube

Install the ink supply tube following the instructions below.

- Arrange the green taped ① side to be on the side of ink bottle case.
- Align the mark ② on the green taped side with the long flexible cable retainer.
- Connect the tube with green tape to the uppermost joint (Bk) on the ink bottle case.
- At the carriage cover side, connect the tube with a mark ③ to the cover tube (Bk) ④.
- Connect the tube to the joint so that the tube reaches the end of the joint.

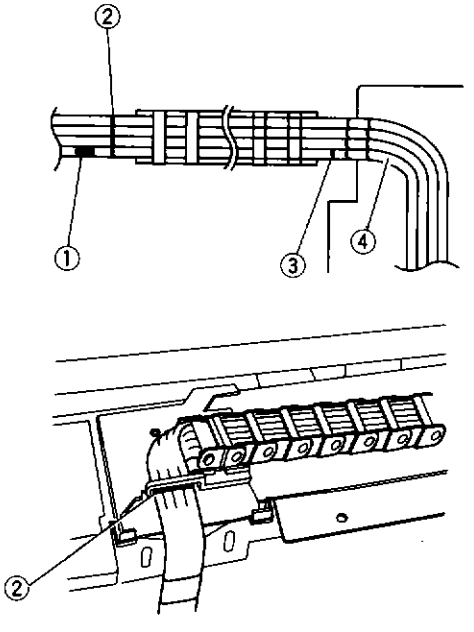

Figure 3-257

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III. PURGE UNIT

1. Precautions When Handling the Purge Unit

- Take care not to touch the wiper blade or cap.
- The waste ink tank is attached to the bottom of the purge unit. When removing or installing the purge unit, hold the sides of the unit. Take care to prevent ink in the waste ink tank from spilling on the floor.
- Before removing the waste ink tank, carry out empty suction to transfer the ink in the feeder tube to the waste ink tank. (See page 3-24.)

2. Removing the Purge Unit

1) Move the carriage to the center of the platen and turn the power switch OFF.
2) Remove the rear cover, right rear cover and right cover.
3) Remove the linear encoder. (See page 3-9.)
4) Remove the pre-discharge tank and waste ink tank. (See page 3-26.)
5) Disconnect all of the connectors on the control panel PCB and relay connectors around the purge unit.
6) Remove 4 mounting screws ① and remove purge unit ②.

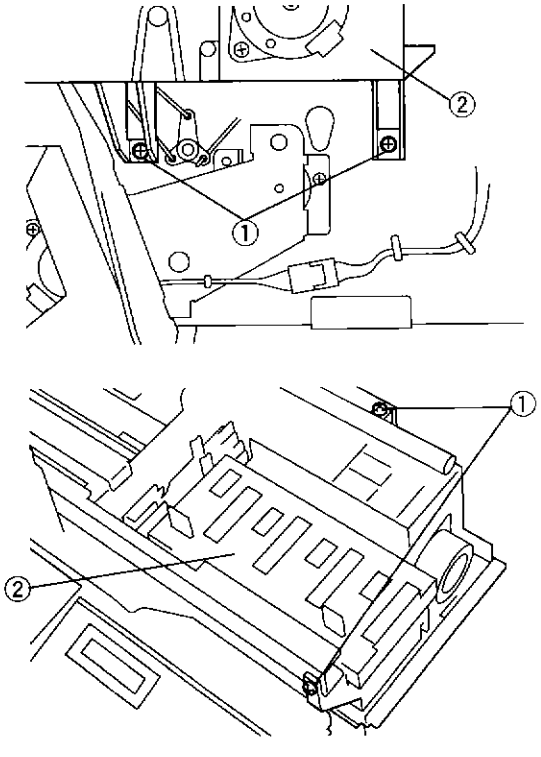

Figure 3-301

3. Removing the Purge Motor

1) Remove the right and right rear covers.
2) Disconnect 6-pin relay connector ① from the purge motor.
   Remove 2 mounting screws ② and remove purge motor ③.

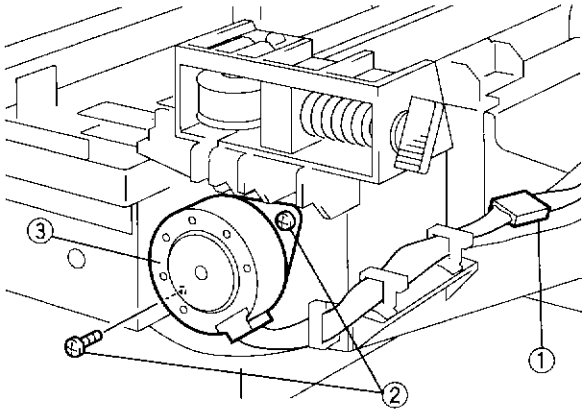

Figure 3-302

4. Removing the Pressure Cam Home Position Sensor

1) Remove the right and right rear covers.
2) Remove the pre-discharge tank and waste ink tank. (See page 3-26.)
3) Remove the 2 hooks to remove sensor installation plate ①.

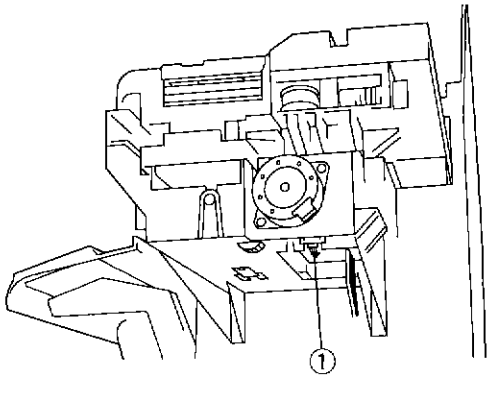

Figure 3-303

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4) Remove pressure cam home position sensor ②.

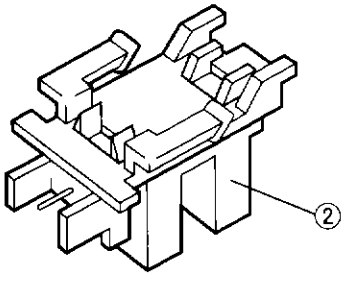

Figure 3-304

5. Removing the Cap Cam Home Position Sensor

1) Remove the right and right rear covers.
2) Remove the pre-discharge tank and waste ink tank. (See page 3-26.)
3) Remove the 2 hooks to remove sensor installation plate ①.

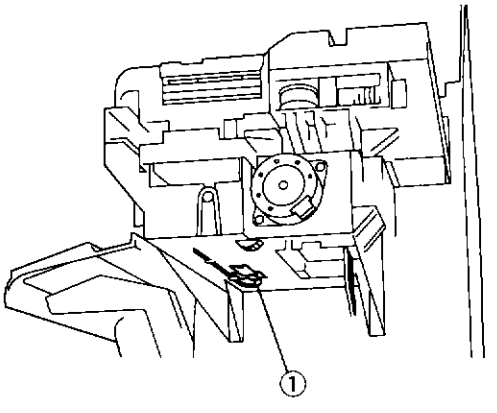

Figure 3-305

4) Remove cap cam home position sensor ②.

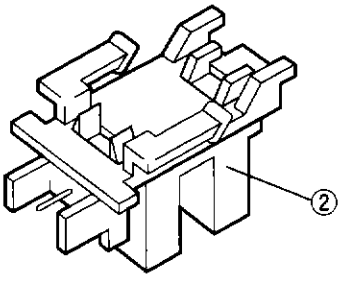

Figure 3-306

6. Removing the Wiper Solenoid

1) Move the carriage to the center of the platen.
2) Remove the right and right rear covers.
3) Remove 2 wiper blades.
4) Disconnect 2-pin relay connector ① from wiper solenoid 2.

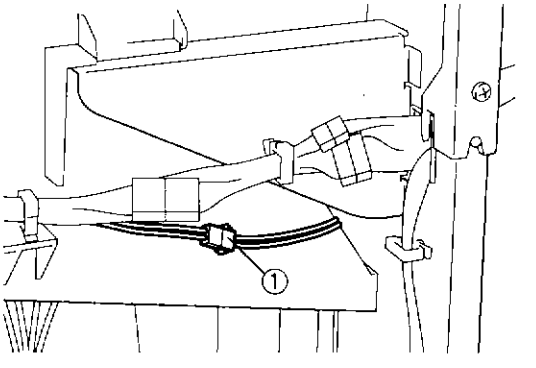

Figure 3-307

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5) Remove 2 mounting screws ②. While sliding the cap holder unit ③ by hand, remove blade mount 2 ④.

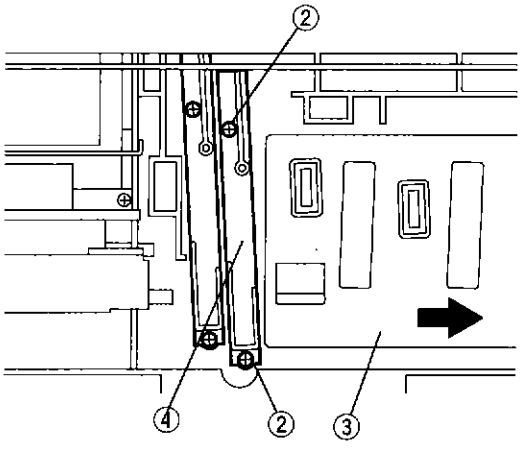

Figure 3-308

6) Remove 2 mounting screws ⑤ and remove wiper solenoid 2 ⑥.

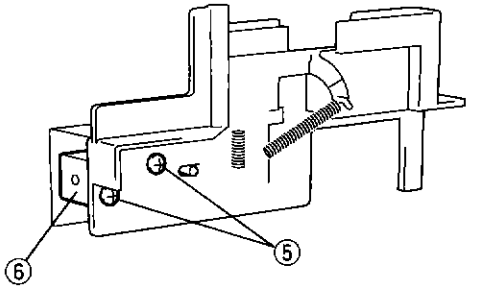

Figure 3-309

7) Disconnect 2-pin relay connector ⑦ from wiper solenoid 1.

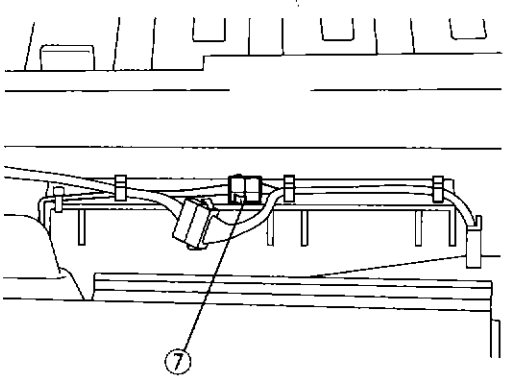

Figure 3-310

8) Remove 2 mounting screws ⑧ and remove blade mount 1 ⑨.

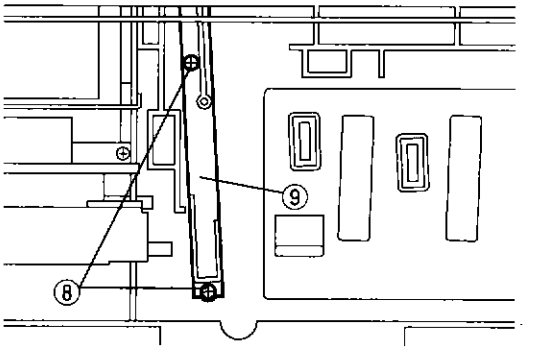

Figure 3-311

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9) Remove 2 mounting screws ⑩ and remove wiper solenoid 1 ⑪.

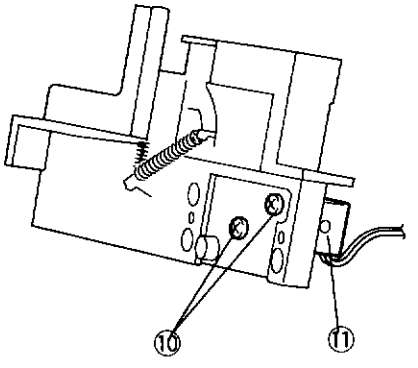

Figure 3-312

7. Installing the Wiper Solenoid

When attaching the blade mount, take the following procedure.

1) Fully tighten the blade height adjuster ①.

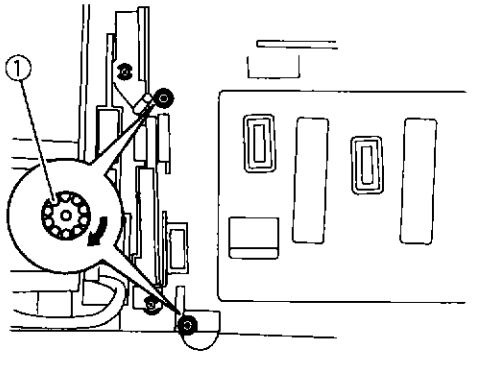

Figure 3-313

2) Return the blade height adjuster counterclockwise by the following amounts:

For Black ink: 1/6 turn
For Color ink: 1/4 turn

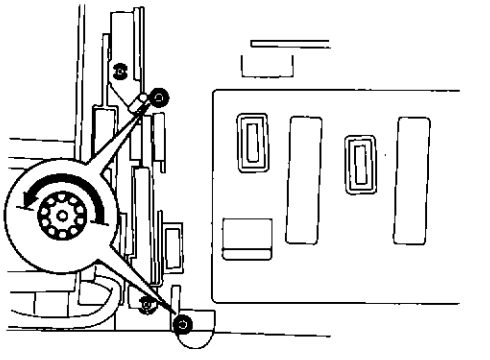

Figure 3-314

3) Attach the blade mount ② by two screws ③ temporarily.
4) While holding the blade height adjuster with an Allen key ④, tighten the screws to fix the blade mount.

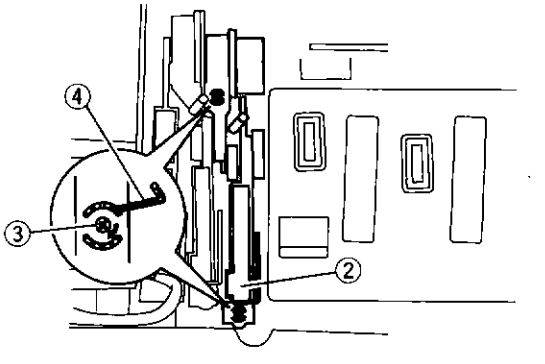

Figure 3-315

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8. Removing the Pre-discharge Tank

1) Remove the right cover.
2) Draw pre-discharge tank ① taking care not to spill waste ink.

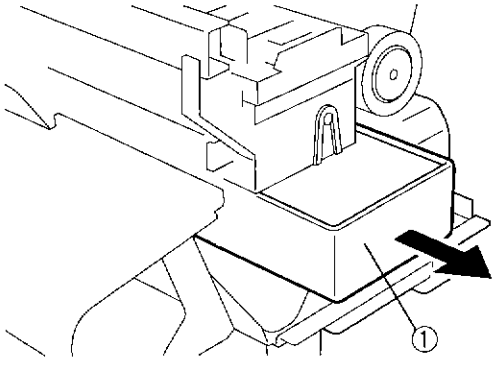

Figure 3-316

CAUTION
When installing the pre-discharge tank, firmly insert the pre-discharge tank as far as it will go.

9. Replacing the Waste Ink Tank

1) Remove the right and right rear covers.
2) De-cap the purge unit.
3) Remove the pre-discharge tank.
4) Turn the gear ① counterclockwise manually to transfer the ink in the feeder tube to the waste ink tank.

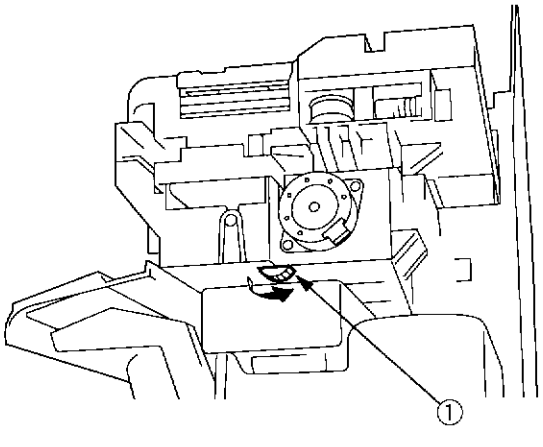

Figure 3-317

5) Draw out tank joint ②, and remove waste ink tank ③ from the body taking care not to spill waste ink.

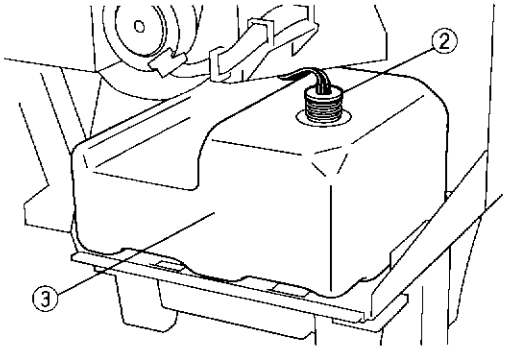

Figure 3-318

CAUTION
Wipe off any ink from the tank joint feeder tube with paper to prevent ink from splashing.

6) Remove cap ④ from replacement waste ink tank ⑤, and install on the waste ink tank ⑥ removed from the body.

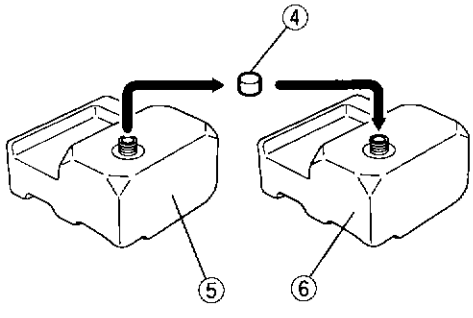

Figure 3-319

7) Place a new waste ink tank on the body and connect the tank joint to the tank.

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10. Removing the Feeder Tube

1) Remove the purge unit. (See page 3-22.)
2) Remove the pressure cam home position sensor. (See page 3-22 and 3-23.)
3) Remove 4 tubes ① from groove ② on the pressure cam guide.

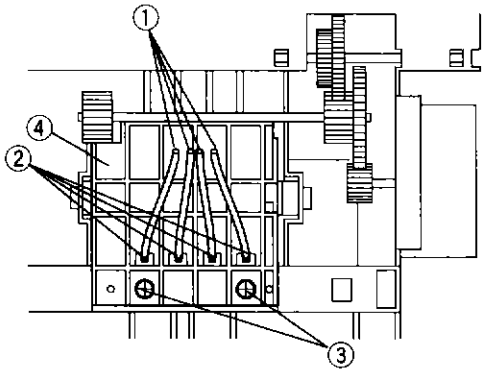

Figure 3-320

4) Remove E-ring ⑤ and draw out gear shaft ⑥ then remove gear ⑦.
Remove E-ring ⑧ and remove gear shaft ⑨.
Then, remofe 2 mounting screws ③ in Figure 3-320, and remove pressure cam guide ④.

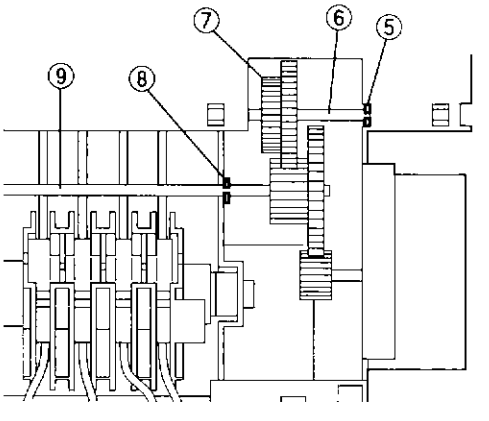

Figure 3-321

5) Remove left and right bushing (2 hooks) ⑩ and remove guide roller ⑪.

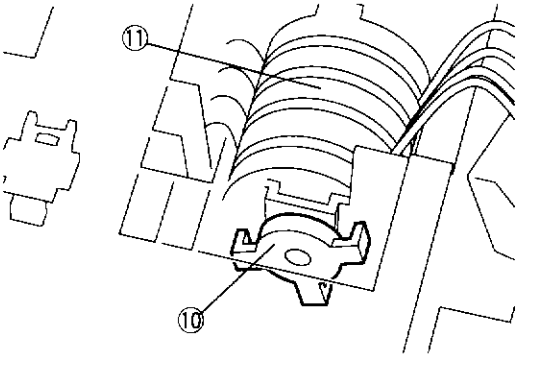

Figure 3-322

6) Remove feeder tube ⑫ from groove ⑬.

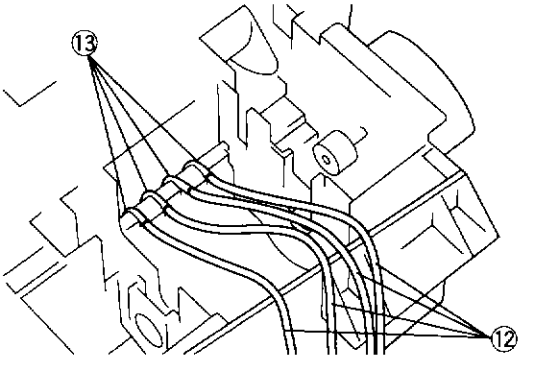

Figure 3-323

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7) Remove 4 springs ⑭ from the bottom side of the purge unit.

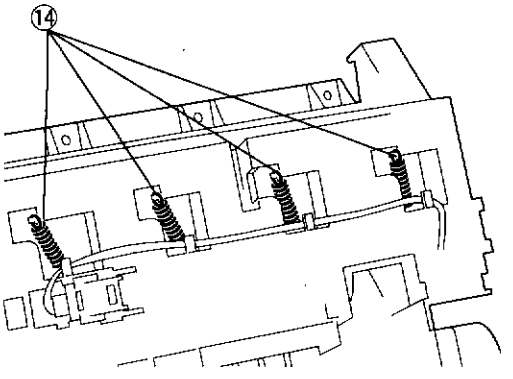

Figure 3-324

8) Remove cap holder unit ⑮.

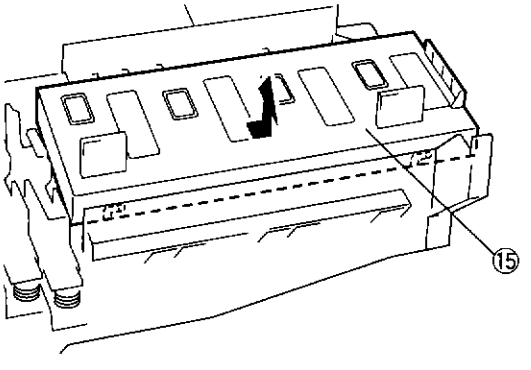

Figure 3-325

9) Remove feeder tube ⑰ from cap ⑯.

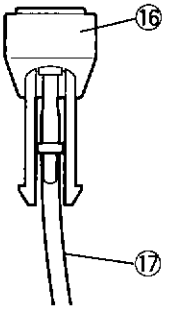

Figure 3-326

11. Feeder Tube Installation Position

1) Insert the feeder tube that were installed on the cap into the grooves matched to marks ①.

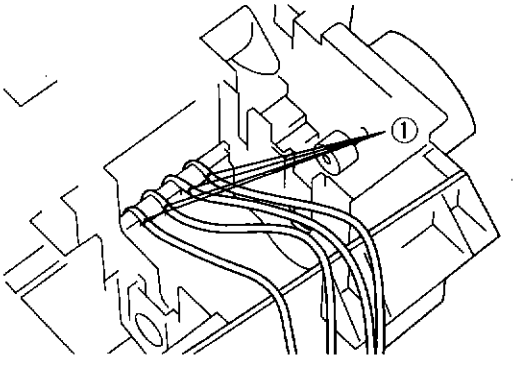

Figure 3-327

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2) Place guide roller ②, and make sure that tubes are inserted into grooves of the guide roller.

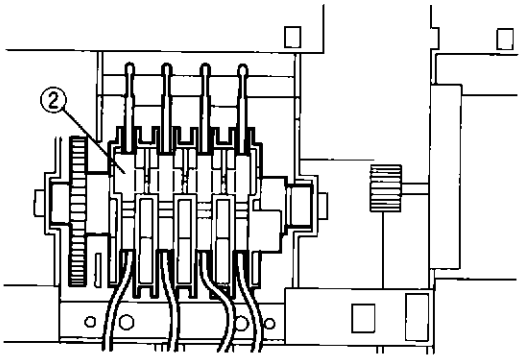

Figure 3-328

3) Attach the pressure cam guide. Insert other mark ③ into groove on the pressure cam guide.

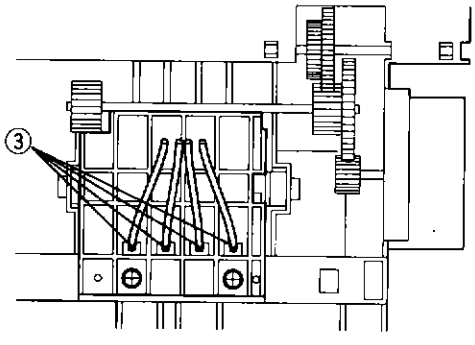

Figure 3-329

12. Cleaning the Wiper Blade

1) Remove the wiper blade.
2) Wipe off any dust or ink on wiper blade ① at the cut surface of the cleaning stick.

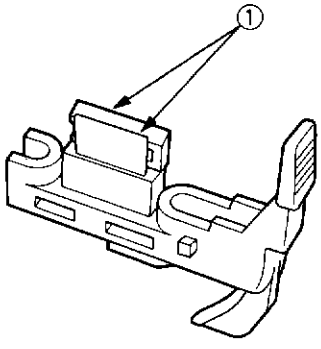

Figure 3-330

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IV. MEDIA FEED SYSTEM

1. Removing the Roll Media Feed Guide Unit

1) Remove the left and right covers.
2) Open the roll media cover.
3) Remove the roll shaft.
4) Remove the control panel. (See page 3-6.)
5) Remove the pre-discharge and waste ink tanks. (See page 3-26.)
6) Remove mounting screws ① (2 each on left and right), and remove roll shaft holders ② (on both left and right).

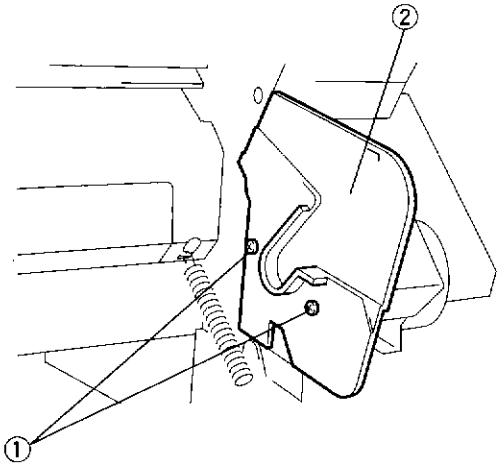

Figure 3-401

7) Remove the roll media cover. (See page 3-4.)
8) Disconnect connector ③, remove 3 mounting screws ④, and remove path change motor unit ⑤.

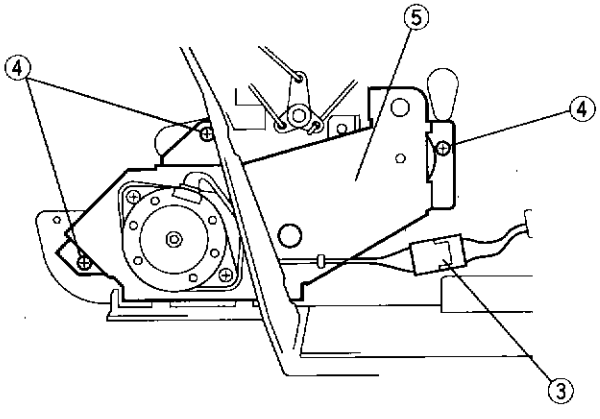

Figure 3-402

9) Remove 2 mounting screws ⑥, and draw out pin ⑦.

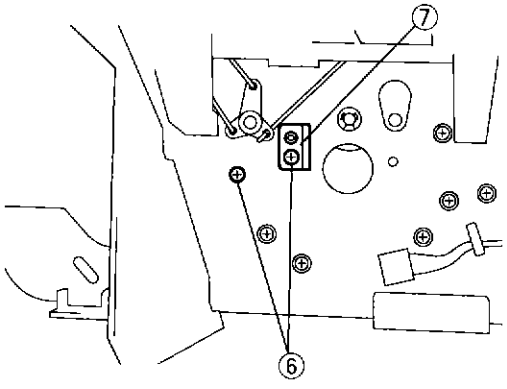

Figure 3-403

10) Remove the media retainer unit and media retainer solenoid. (See page 3-18.)
11) Disconnect the connector ⑧ and remove the stepped screw ⑨.
Remove the mounting screw ⑩ to remove switch mounting plate ⑪.
Remove a screw ⑫.

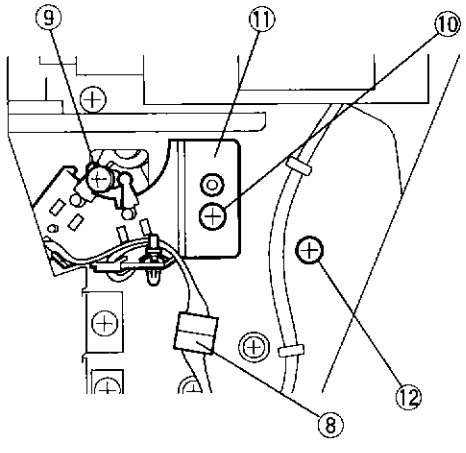

Figure 3-404

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12) Remove roll media feed guide unit ⑬.

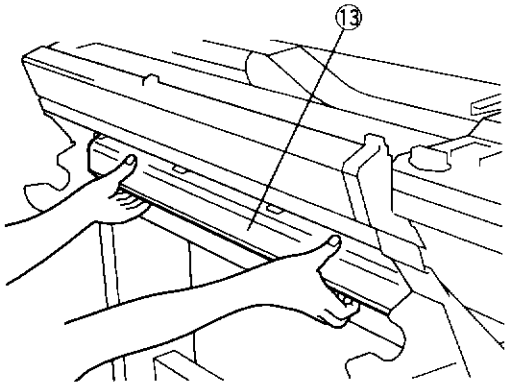

Figure 3-405

2. Removing the Platen

1) Open the dust cover and lower the feeder unit release lever.
2) Remove 2 mounting screws ①, and remove the platen ②.

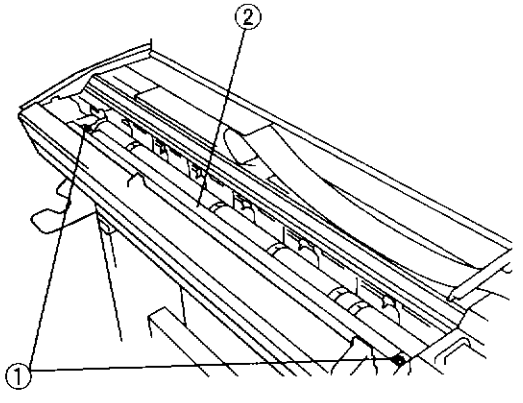

Figure 3-406

CAUTION

1. Do not touch the surface of the platen.
2. When attaching the platen, make sure that two hooks are hooked in place as shown in Figure 3-407.
3. After installing the platen, carry out the adjustment of the media sensor gain and media sensor light intensity. (See pages 5-7 and 5-8.)

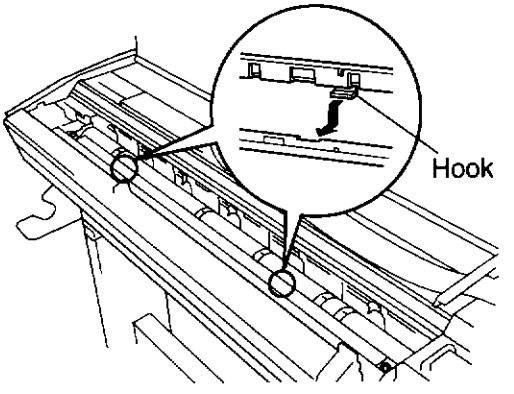

Figure -3-407

3. Removing the Feed Roller

1) Remove the left, right, rear and right rear covers.
2) Remove the linear encoder. (See page 3-9.)
3) Remove the roll media feed guide unit. (See page 3-30.)
4) Disconnect the connector ① and remove the screw ②, remove the sensor mount ③ from the rear of the printer.

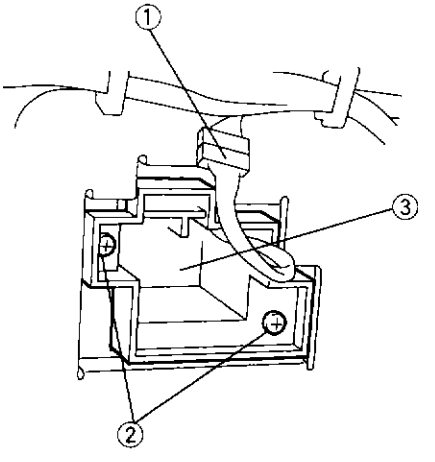

Figure 3-408

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5) Remove 6 stepped screws ④, and remove pinch roller 2 upper unit ⑤ from the right unit.

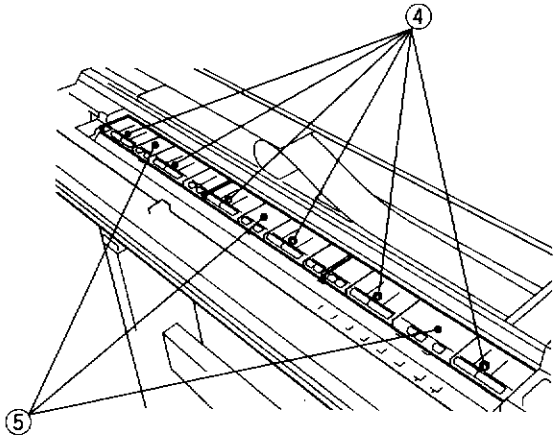

Figure 3-409

6) Remove 6 springs ⑥.

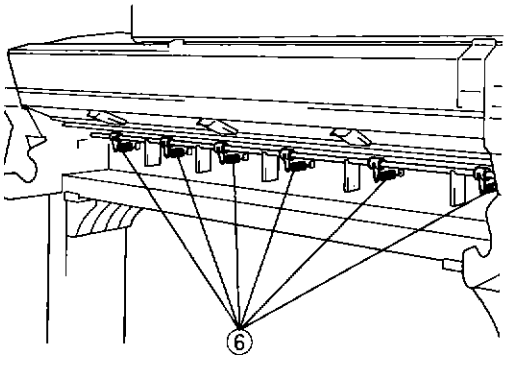

Figure 3-410

7) Remove 6 mounting screws ⑦, and remove 6 pinch roller 2 lower units ⑧.

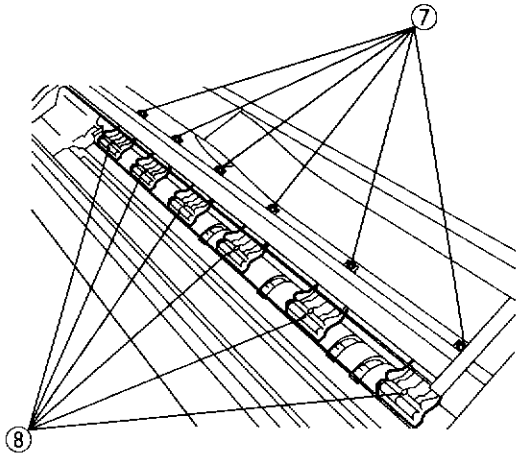

Figure 3-411

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8) Remove spring ⑨ from the left of the printer, and remove media retainer wire ⑩.

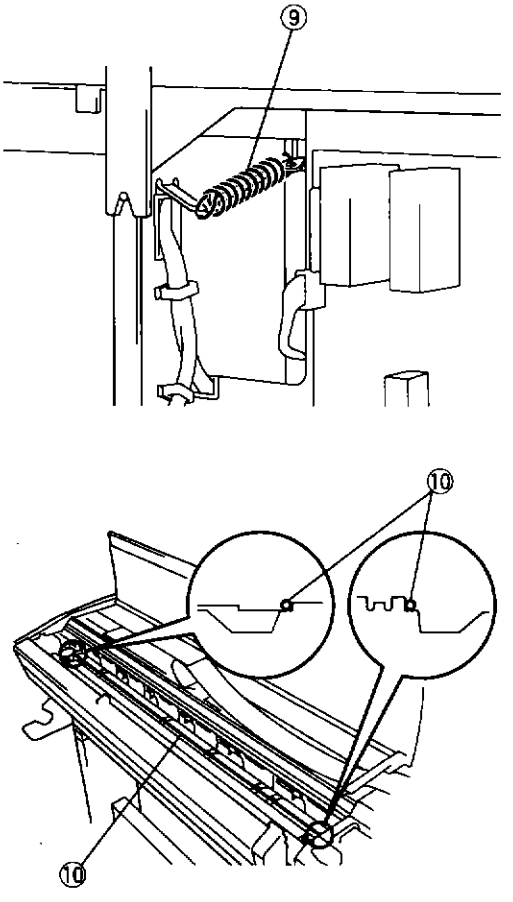

Figure 3-412

CAUTION
When attaching the media retainer wire, pay attention to the position of the wire on the side plate.

9) Remove the platen. (See page 3-31.)
10) Remove 2 mounting screws ⑪ and remove gear ⑫.

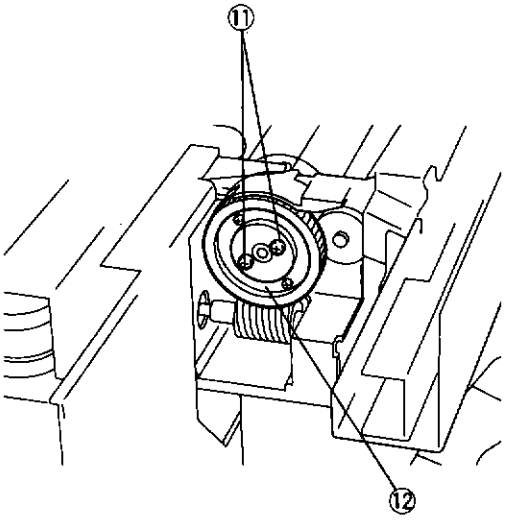

Figure 3-413

11) Remove 2 set screws ⑬ from the flange ⑭.

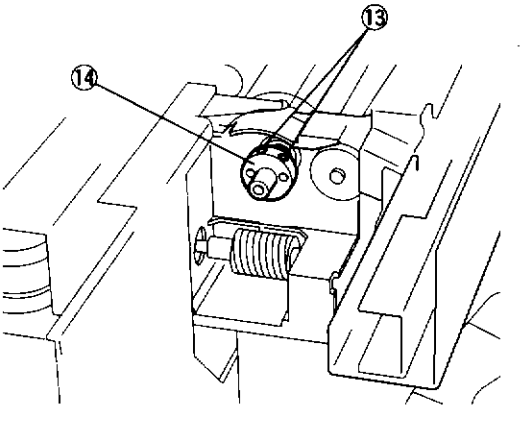

Figure 3-414

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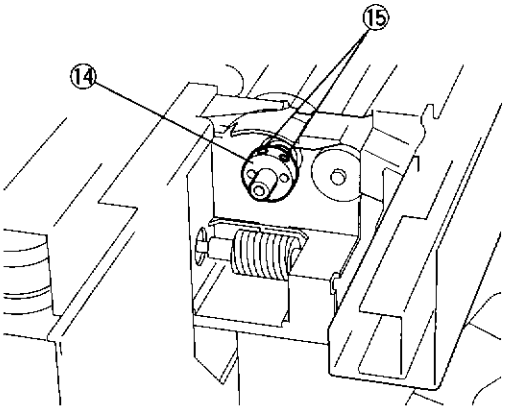
12) Loosen 2 set screws ⑮ and remove flange ⑭.



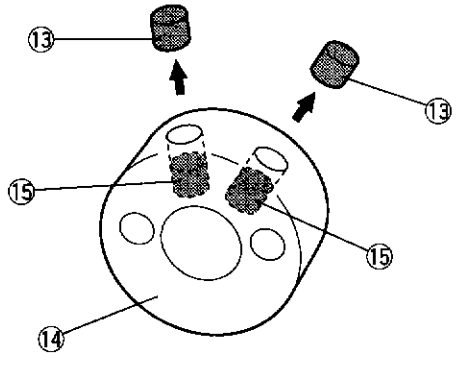


Figure 3-415

CAUTION
When installing the flange, secure the flange with it pushed inside as far as possible.

13) Disconnect connector (J305) ⑯ from motor controller PCB ⑰.

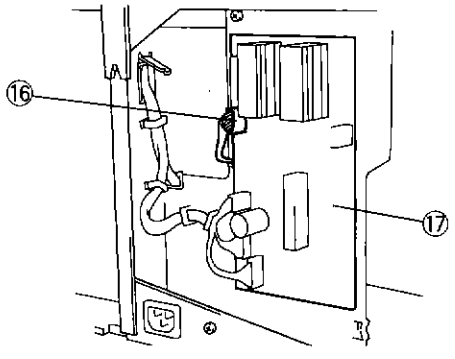


Figure 3-416

14) Remove 3 mounting screws ⑱ and remove X-axis motor unit ⑲.

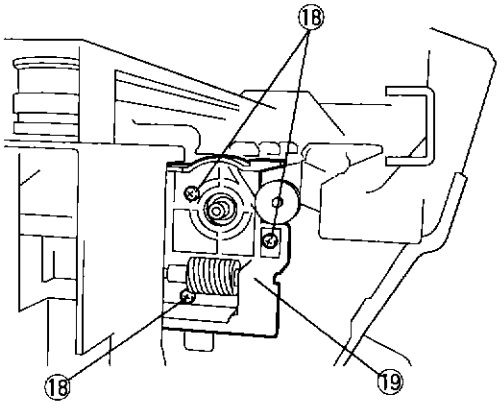


Figure 3-417

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15) Remove feed roller ⑳.

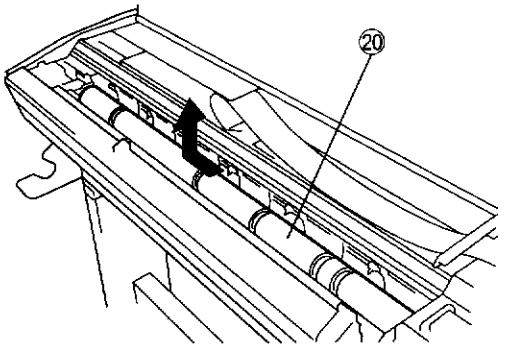


Figure 3-418

4. Removing the Spur Unit

1) Remove the left and right covers.
2) De-cap the purge unit.
3) Move the carriage to the center of the platen by hand.
4) Remove E-ring ① from the right of the spur unit ②.

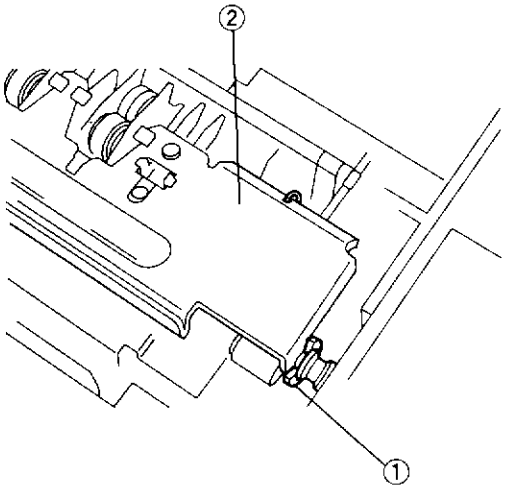
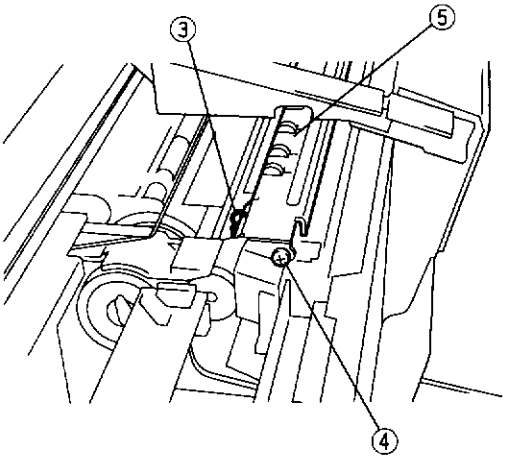


Figure 3-419

5) Move the carriage to the home position.
6) Remove 2 springs ③. Remove the stepped screw ④, and remove spur unit ⑤.



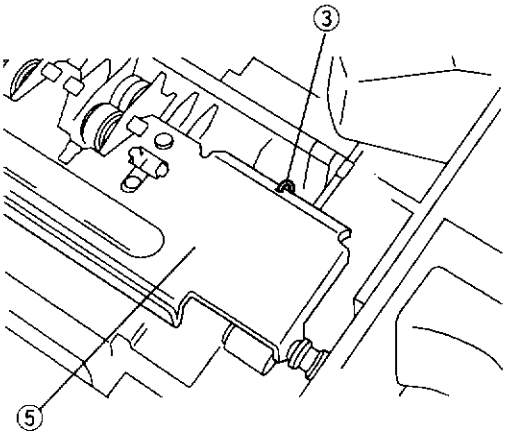


Figure 3-420

CAUTION

- Take care not to break the actuator of the media discharge sensor below the spur unit.
- The left and right springs are different. Longer one is attached to the right side.

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5. Removing the Media Discharge Roller

1) Remove the left and right covers.
2) Remove the media retainer unit. (See page 3-18.)
3) Remove the spur unit. (See page 3-35.)
4) Remove 4 mounting screws ① and remove media discharge lower guide ②.

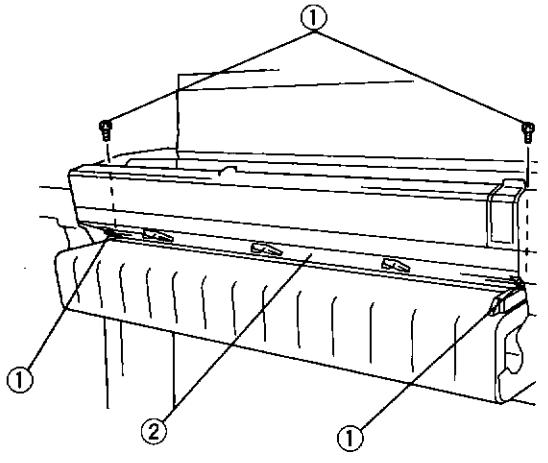

Figure 3-421

5) Remove 2 mounting screws ③ and remove media discharge guide ④.

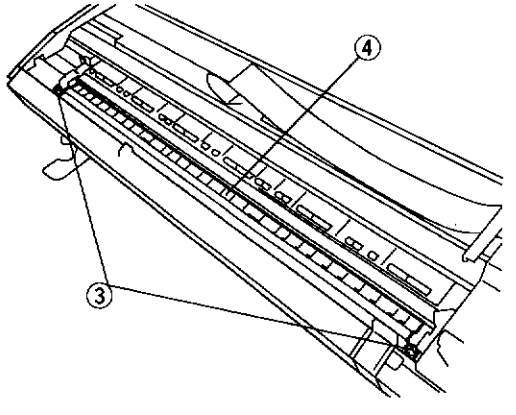

Figure 3-422

6) Loosen 4 set screws ⑤, and remove 4 mounting screws ⑥.

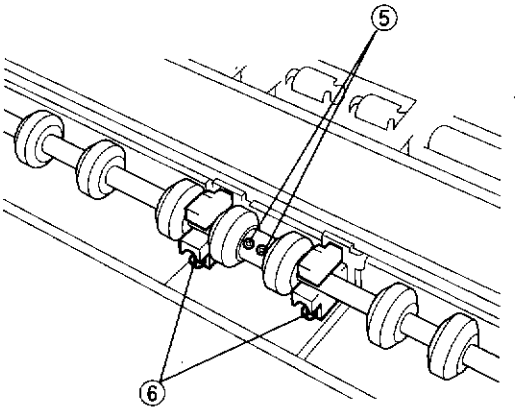

Figure 3-423

CAUTION
When attaching the media discharge rollers, make sure that both ends of the roller shaft are pushing against the rollers before tightening the set screws.

7) Remove the screw ⑦.

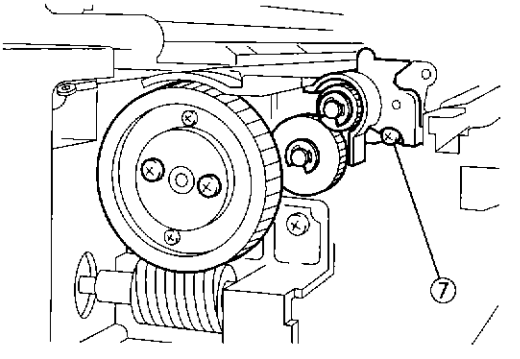

Figure 3-424

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8) Remove media discharge roller ⑧.

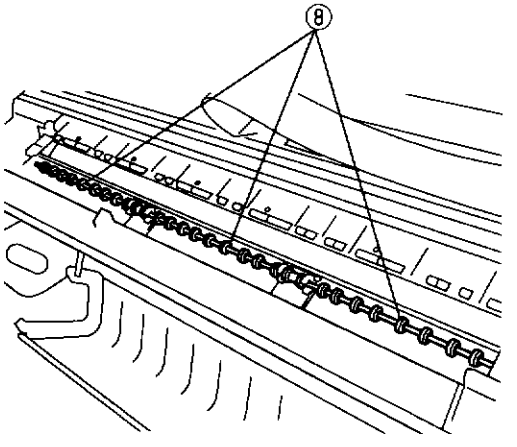

Figure 3-425

6. Removing the Cut Sheet Trailing Edge Sensor

1) Remove 4 mounting screws ① and remove media discharge lower guide ②.

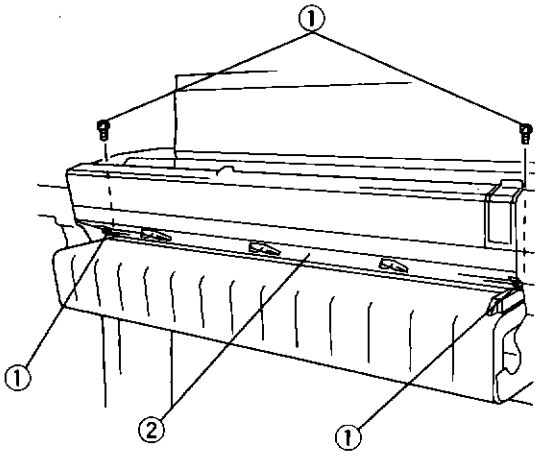

Figure 3-426

2) Disconnect connector ③ and remove 2 mounting screws ④ then remove cut sheet trailing edge sensor ⑤.

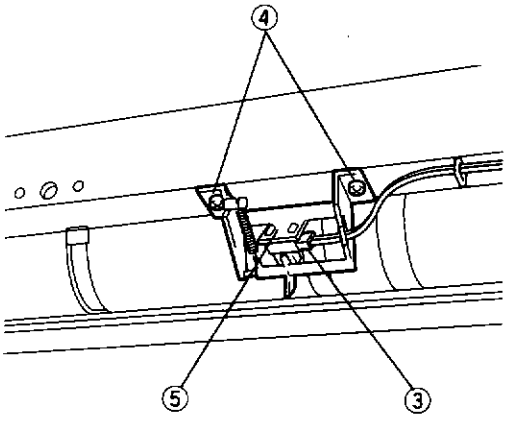

Figure 3-427

7. Removing the Roll Media Detection Sensor/Cut Sheet Detection Sensor

1) Remove the rear cover.
2) Disconnect connector ① and remove 2 mounting screws ② then remove sensor mount ③.

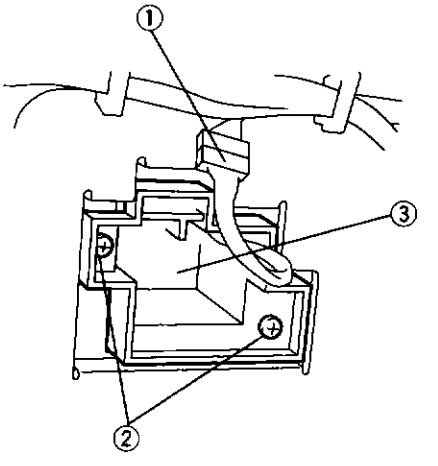

Figure 3-428

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3) Disconnect connector ④, and remove roll media detection sensor ⑤ and cut sheet detection sensor ⑥.

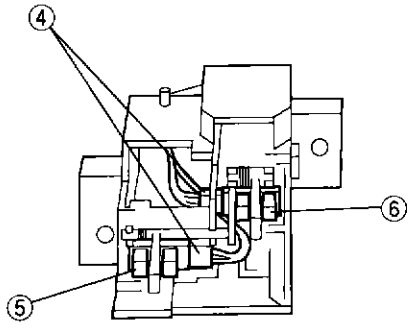

Figure 3-429

8. Removing the Media Discharge Sensor

1) Remove the left and right covers.
2) Remove the spur unit. (See page 3-35.)
3) Remove 2 mounting screws ① and remove media discharge guide ②.

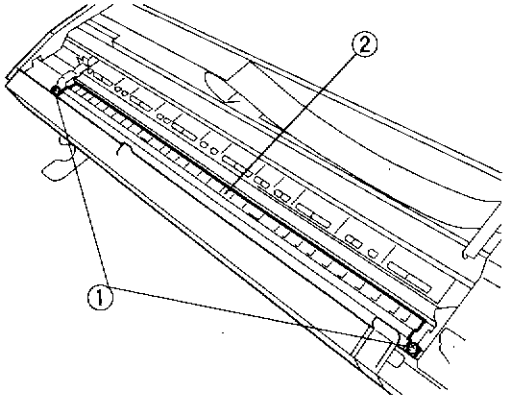

Figure 3-430

4) Disconnect connector ③ and remove mounting screw ④ then remove media discharge sensor ⑤.

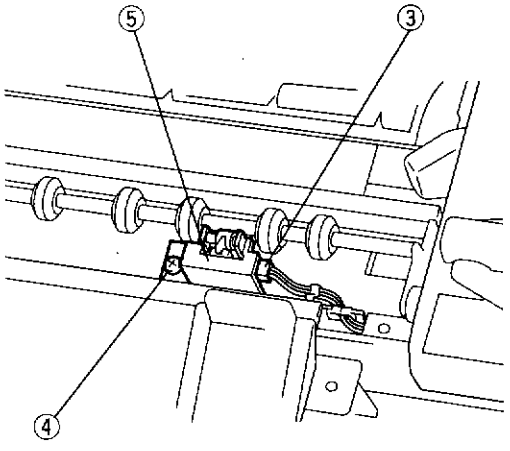

Figure 4-431

9. Removing the Cut Sheet Position Switch/Roll Media Position Switch

1) Remove the left cover.
2) Disconnect connector ① and remove mounting screw ② then remove switch mounting plate ③.

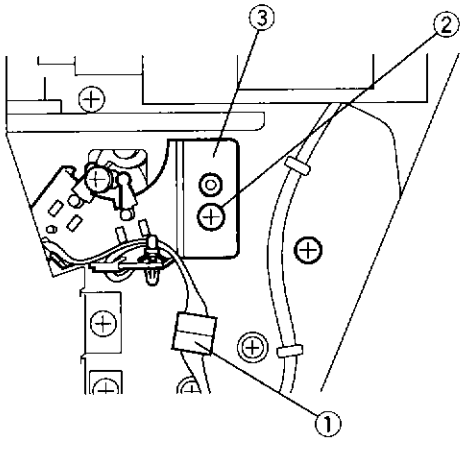

Figure 4-432

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3) Disconnect connectors ④, and remove cut sheet position switch ⑤ and roll media position switch ⑥.

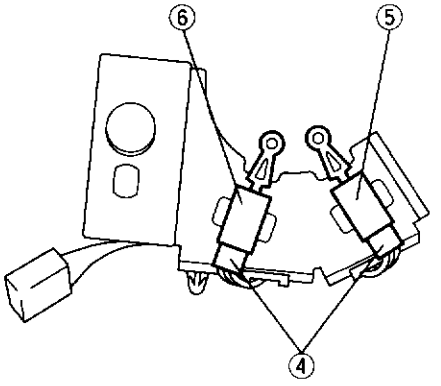

Figure 4-433

10. Removing the Path Change Motor

1) Remove the right cover.
2) Remove the pre-discharge and waste ink tanks. (See page 3-26.)
3) Remove the control panel. (See page 3-6.)
4) Disconnect connector ① and remove 2 mounting screws ② then remove path change motor ③.

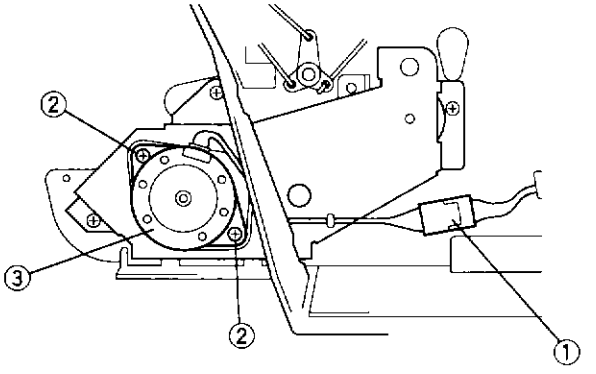

Figure 4-434

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V. DRIVE

1. Removing the X-axis Motor

1) Remove the left and left rear covers.
2) Remove media retainer unit and media retainer solenoid. (See page 3-18.)
3) Disconnect connector (J305) ① from the motor controller PCB.

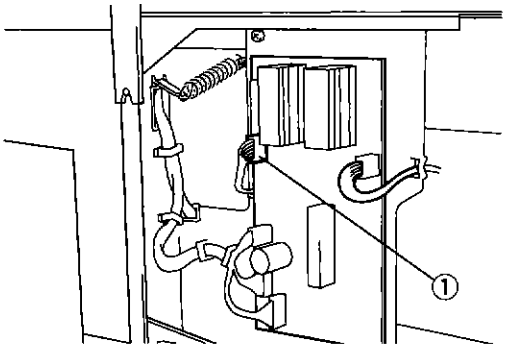

Figure 3-501

4) Remove 2 mounting screws ② and remove gear ③.

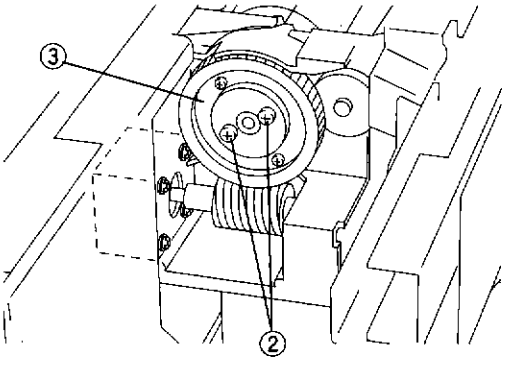

Figure 3-502

5) Loosen 3 set screws ④ with an Allen key.

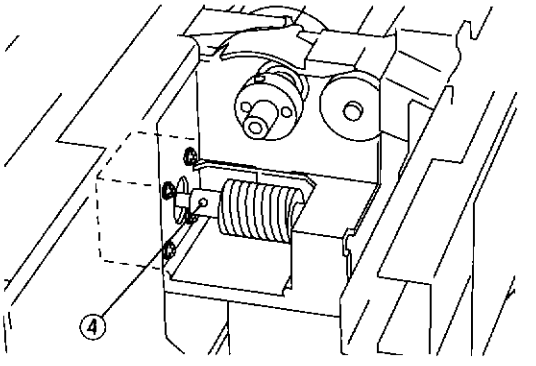

Figure 3-503

6) Remove 4 mounting screws ⑤ and remove X-axis motor ⑥.

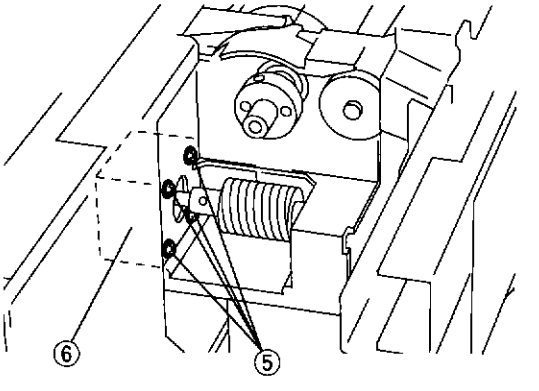

Figure 3-504

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2. Removing the Y-axis Motor

1) Remove the left and left rear covers.
2) Disconnect connector (J304) ① from the motor controller PCB.

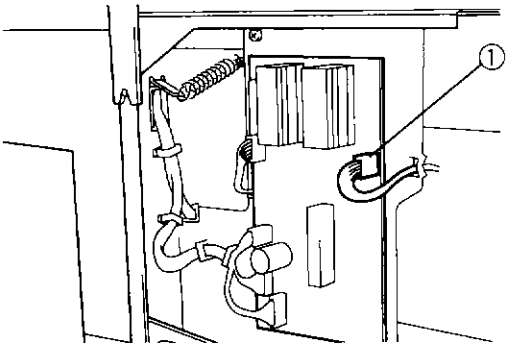

Figure 3-505

3) Remove wire guard ② from the hook on the right.

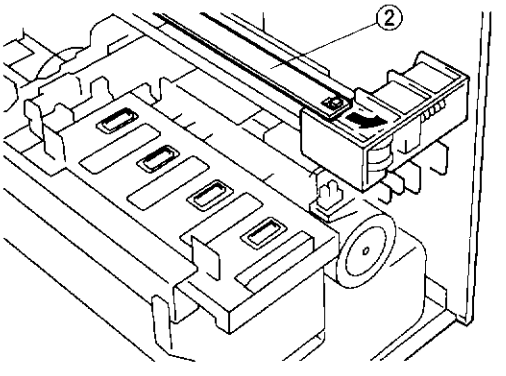

Figure 3-506

4) Remove wire guard ② and spring ③ from the left of the printer.

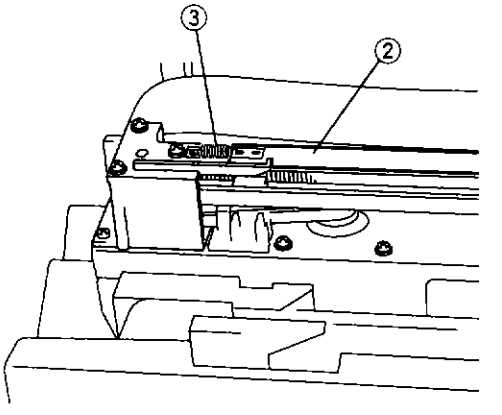

Figure 3-507

5) Loosen 2 mounting screws ④ of the belt tensioner.

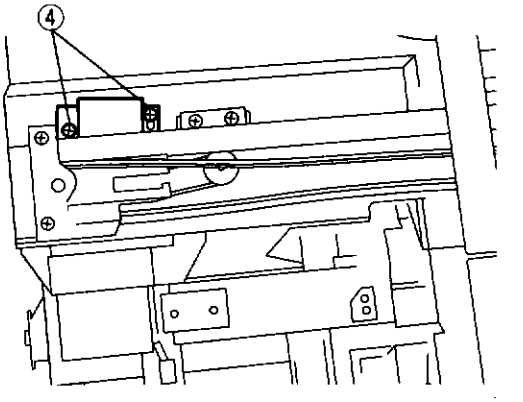

Figure 3-508

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6) Remove 4 mounting screws ⑤ and remove Y-axis motor ⑥.

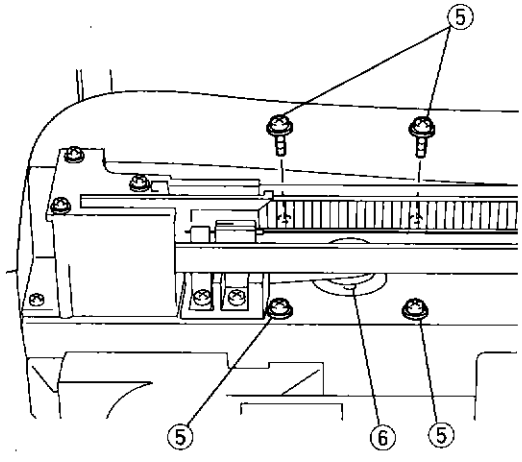

Figure 3-509

CAUTION

- When using a magnetized driver, take care to prevent the driver from coming near the memory wire.
- When securing the belt tensioner, secure the belt tensioner so that its hole are at the position as shown in Figure 3-510.

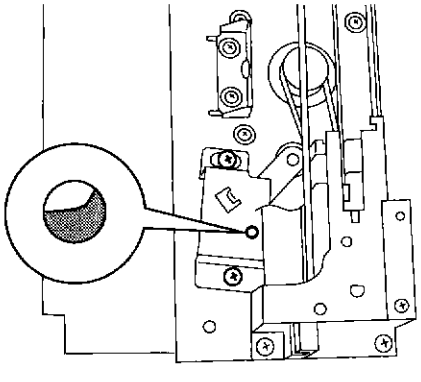

Figure 3-510

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3. Removing the Carriage Drive Belt

1) Remove the cover caterpillar unit. (Refer to page 3-7).
2) Cancel the capping of the purge unit.
3) Manually move the carriage to the center of the platen.
4) Remove the wire guard ① from the right hook.

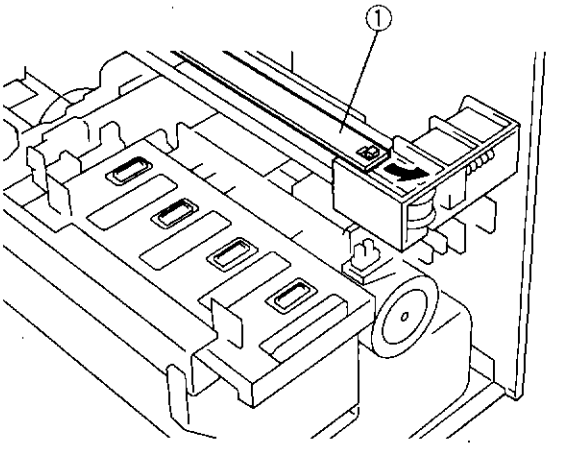

Figure 3-511

5) Remove the spring ② and the wire guard ③ from the left side of the printer.

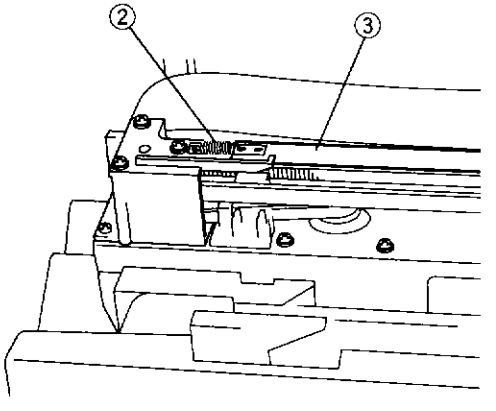

Figure 3-512

6) Remove the tension stopper ④ turning it clockwise and remove the tension spring ⑤ and the tension lever ⑥.

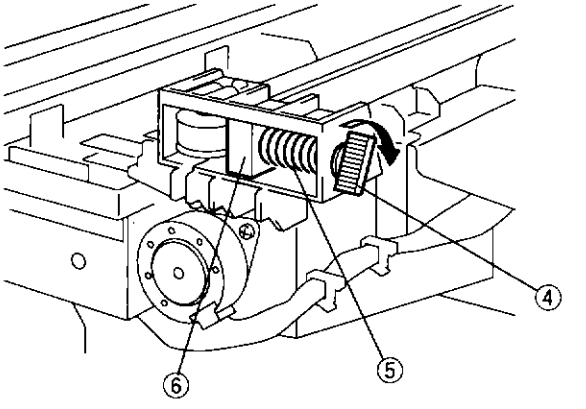

Figure 3-513

7) Disconnect the connectors (J401, J403 and J404) of the short flexible cable from the carriage PCB.
8) Remove the belt stopper ⑧, pressing the carriage drive belt ⑦ to the stopper side. Then, remove the carriage drive belt.

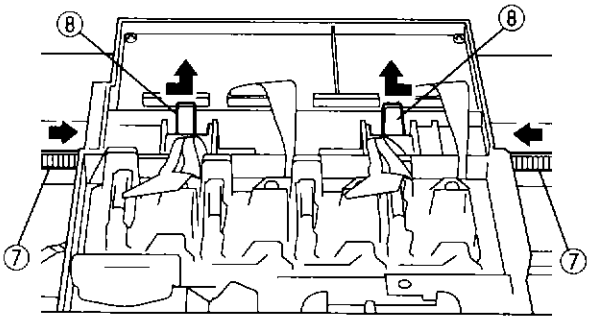

Figure 3-514

4. Installing the Carriage Drive Belt

Install the belt stopper so that the carriage drive belt is at the position shown in Figure 3-515.

After installing the carriage drive belt, carry out the adjustment of the carriage drive belt tension. (See page 5-4.)

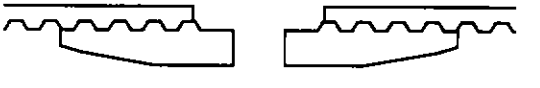

Figure 3-515

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VI. INK BOTTLE CASE

1. Removing the Ink Bottle Case

1) Move the carriage to the center and turn off the power.
2) Remove the head joint ① from the cartridge and insert the head joint in the joint stand.
3) Open the tube cock ② and return the ink in the tube to the buffer section.

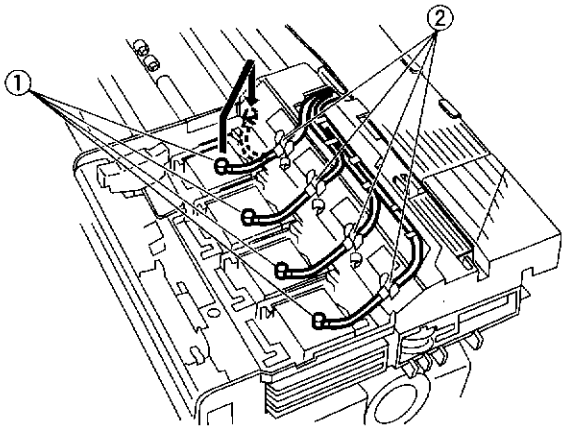

Figure 3-601

4) Remove the mounting screw ③ and remove the tube cover ④.

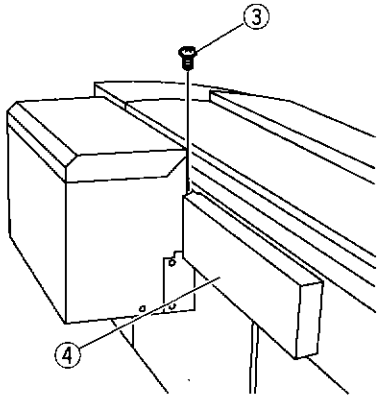

Figure 3-602

5) Disconnect the four tubes ⑤ from the printer body and the connector ⑥.

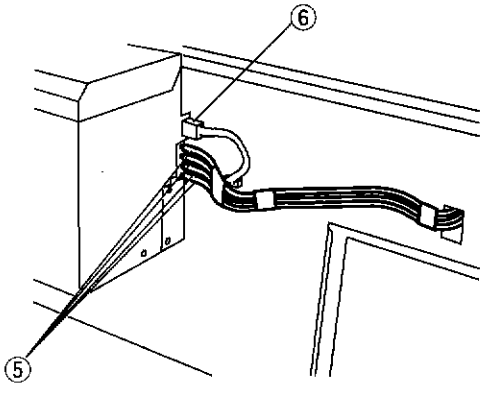

Figure 3-603

CAUTION

When connecting the tubes, make sure that the tube with green tape connect the uppermost joint (Bk) on the ink bottle case.

6) Insert the parallel pins ⑦ to the end of ink supply tubes.

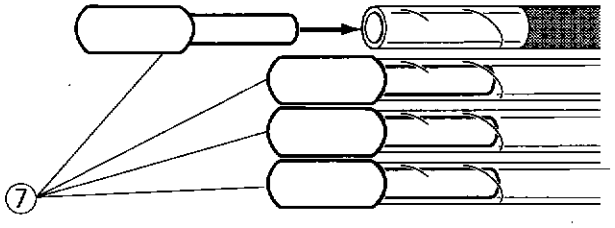

Figure 3-604

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7) Cap the joint of ink bottle case with joint cap ⑧.

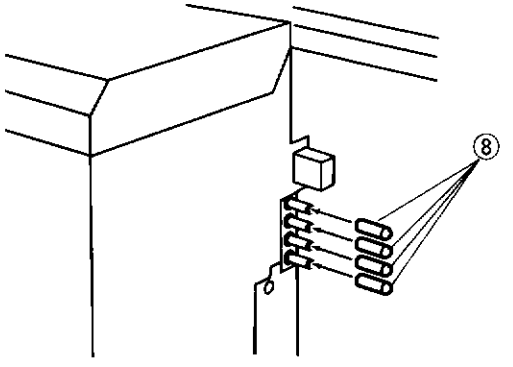

Figure 3-605

8) Remove the two mounting screws ⑨ and remove the ink bottle case ⑩.

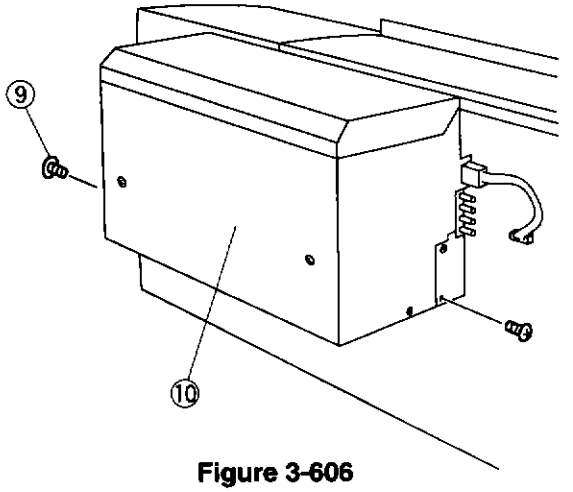

Figure 3-606

CAUTION

Do not lay or give shock ink bottle case. Doing it may result in spill the ink.

2. Removing the Buffer Tube

The procedure is exactly the same for all four buffer tubes. In this description, the example of buffer tube (Y) is taken to explain the procedure.

1) Remove the ink bottle case. (Refer to page 3-44).
2) Remove all ink bottles.
3) Remove the four tube guides ①.

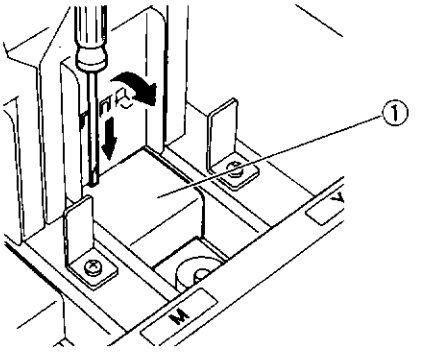

Figure 3-607

CAUTION

Take care to prevent ink in the buffer secution from spilling.

4) Remove the buffer tube ② from the buffer electrode.

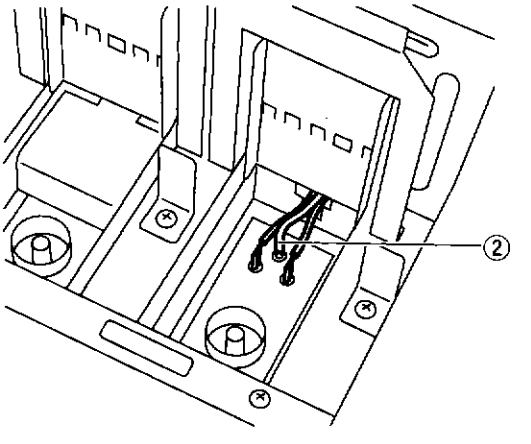

Figure 3-608

CAUTION

Before handling buffer electrode section, remove ink bottle case from printer body in order to prevent damage to ink detection PCB by static electricity.

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5) Rremove the buffer tube ④ from the joint ③.

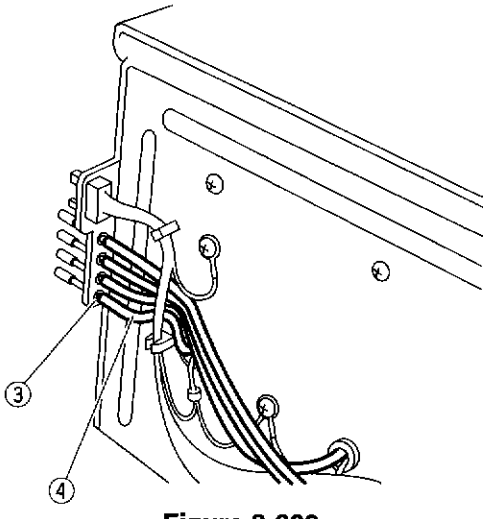

Figure 3-609

3. Buffer Tube Connection Position

Connect the buffer tube following the instructions below.

- Since each buffer tube has a different length, connect each of them to the correct position.
- Connect the tube to the joint so that the tube reaches the end of the joint.

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VII. ELECTRICAL

1. Removing the Image Controller PCB

1) Remove the seven mounting screws ① and remove the expansion cover ②.

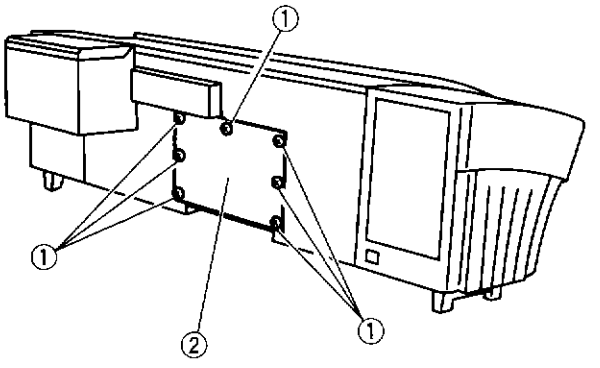

Figure 3-701

CAUTION
Before starting the procedure, make sure that the power code is disconnected because there are many DC power supply PCB at the image controller PCB side.

2) Remove the two mounting screws ③ at the interface connection section.

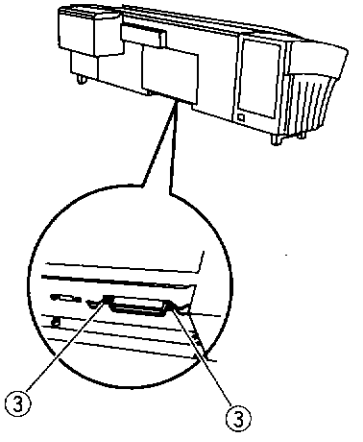

Figure 3-702

3) Disconnect the two connectors ④ and remove the eleven mounting screws ⑤ on the image controller PCB.

4) While removing the connector ⑥ to the engine controller PCB, remove the image controller PCB ⑦.

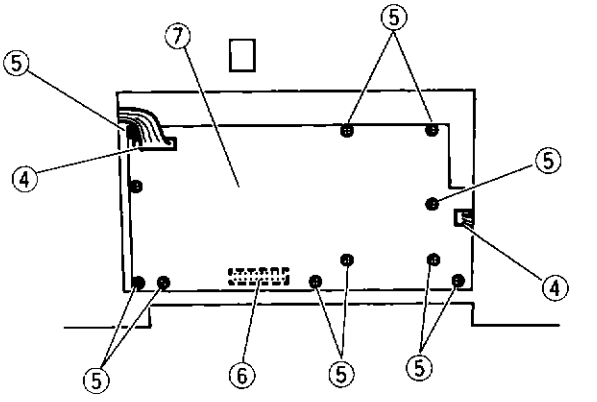

Figure 3-703

CAUTION
When the image controller is installed, secure the connector to the engine controller PCB.

2. Removing the Engine Controller PCB

1) Remove the rear cover. (Refer to page 3-2 and 3-3).
2) Disconnect the two connectors ① and remove the twelve mounting screws ② on the image controller PCB and remove the image controller PCB ③.

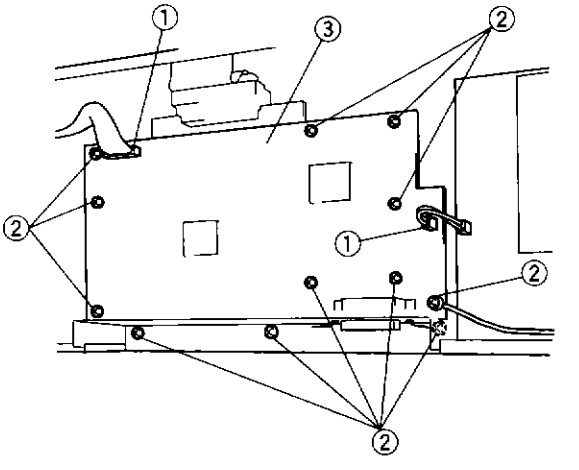

Figure 3-704

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3) Remove the two mounting screws ④ and disconnect the connector(J206) ⑤ of the long flexible cable.

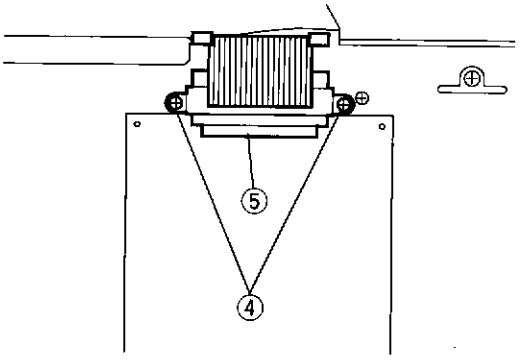

Figure 3-705

4) Disconnect the nine connectors ⑥ and remove the two mounting screws ⑦ on the engine controller PCB. Then remove the engine controller PCB ⑧.

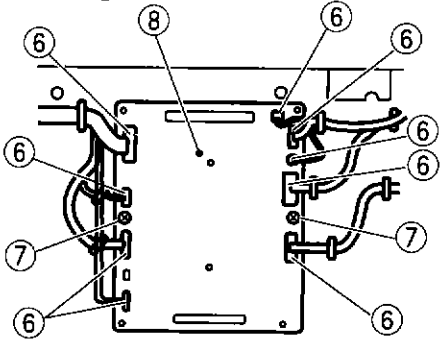

Figure 3-706

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I. PERIODICALLY REPLACED PARTS

This printer does not have any parts that must be replaced periodically. However, when you visit the customer, check the following parts:

- Waste ink tank

II. DURABLES

This printer does not have any parts that must be replaced at least once during the life cycle due to deterioration or damage.

III. SCHEDULED MAINTENANCE

This printer does not have any locations that must be serviced periodically.

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I. MAINTENANCE AND INSPECTION

A. Service Points

No.	Location	Tool/Solvent	Work/Precautions
①	Pre-discharge tank	——	Check.
②	Waste ink tank	——	Check or replace.
③	Wiper blade 1, 2	Cleaning stick	Clean or replace.
④	Roll media cover	Moist cloth	Clean.
⑤	Spur/spur cleaner	Lint-free paper	Remove dust or replace unit.
⑥	Pinch roller 2	Moist cloth	Clean.
⑦	Platen	Moist cloth	Wipe off the dust from the platen.

Table 5-101

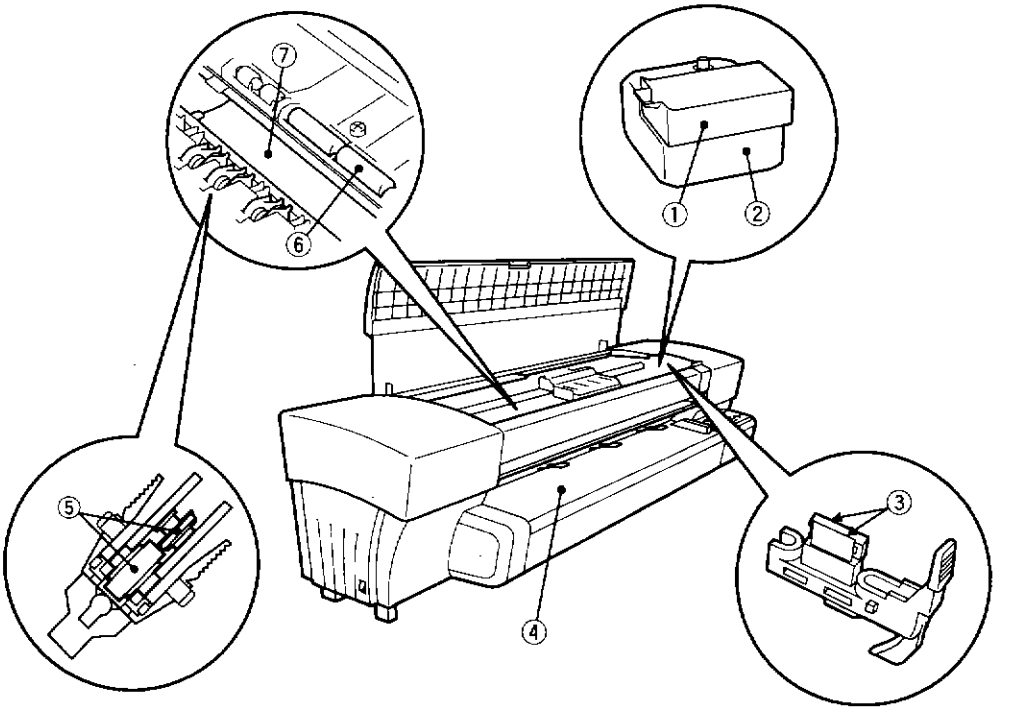

Figure 5-101

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II. STANDARDS AND ADJUSTMENTS

A. Mechanical System

1. Adjustment of the Media Illumination Lamp Optical Axis

Follow the procedure below to adjust the optical axis of the media illumination lamp after the media illumination lamp or media sensor have been replaced.

1) Open the dust cover, and insert the cover switch jig.

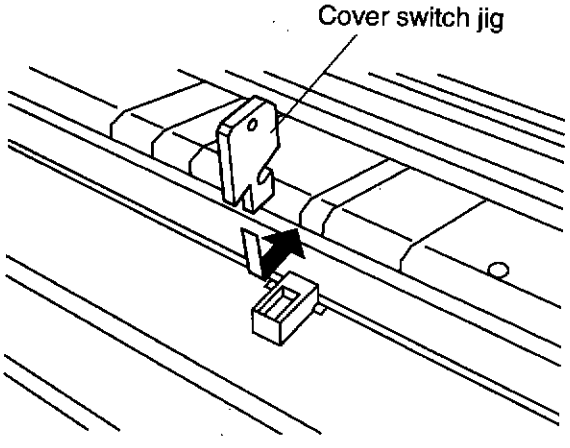


Figure 5-201

2) Set the printer to the service mode, and select "Sensor Gain."
(Refer to page 5-43 about Service Mode descrivibing below)

```
Sensor Gain
          No
```

3) Select "Yes" and press the down arrow key.

```
Sensor Gain
[Please Load Med
```

[Please Load Media]

4) Insert the media into the printer.
   - The carriage moves over the platen, and the media illumination lamp lights.

```
Sensor Gain
[Adjust VR. Then
```

[Adjust VR. Then Press ↓]

5) Hold the media sensor by hand against the carriage.

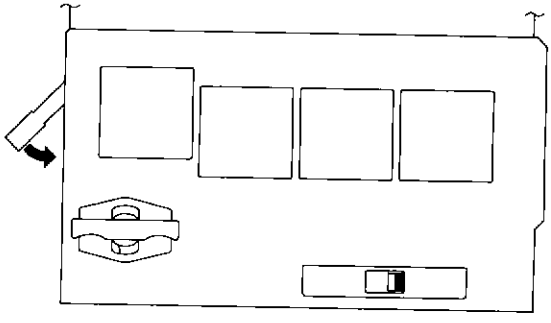
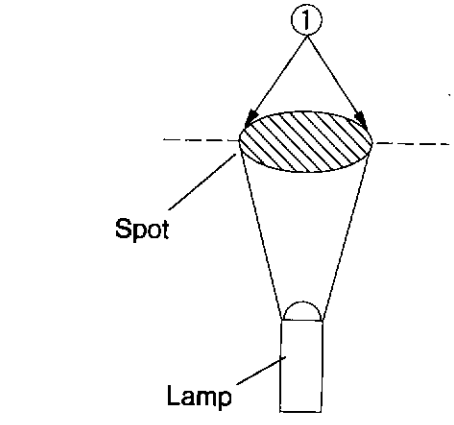
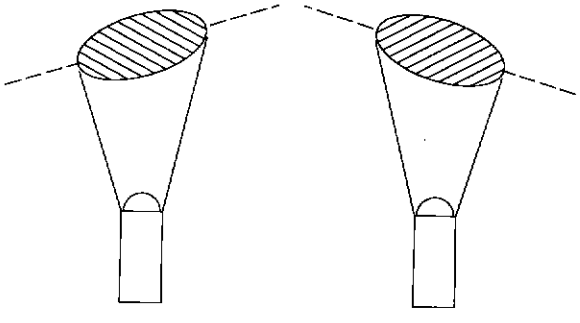


Figure 5-202

6) In this state, make sure that spot-shaped apex ① radiated on the platen is parallel to the Y-axis (direction of carriage movement).



OK



NG

Figure 5-203

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7) Press the down arrow key.
   - The media illumination lamp goes out.

S e n s o r G a i n
[R e a d j u s t G a i n a

[Readjust Gain and Press ↓ or Power Off]

8) If the apex of the light spot is not parallel, follow the procedure below to adjust.
9) Remove the three hooks, and remove the lamp cover from the media sensor.

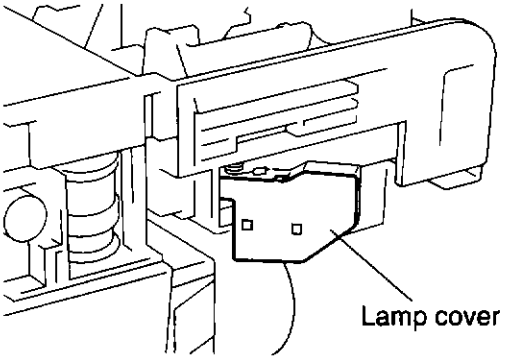

Figure 5-204

CAUTION
Take care to prevent the filters and lens in the media sensor from falling.

10) Turn the media illumination lamp.

CAUTION
- The media illumination lamp becomes hot after it is turned ON.
- Turn the media illumination lamp until the mark at the top of the lamp is at the center as shown in Figure 5-205.

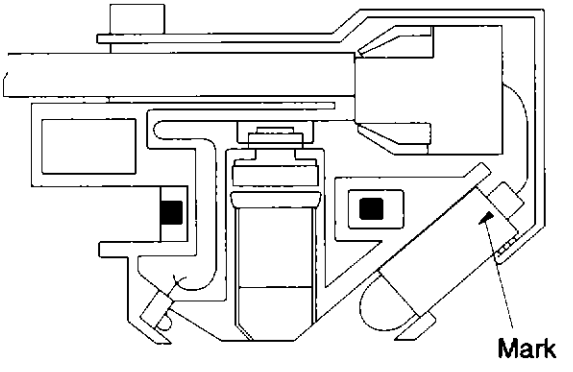

Figure 5-205

11) Install the lamp cover.
12) Press the down arrow key.
   - The media illumination lamp lights.

S e n s o r G a i n
[A d j u s t G a i n . T h e

[Adjust Gain. Then Press ↓]

13) In this state, make sure that spot-shaped apex radiated is parallel to the Y-axis.
14) Press the down arrow key.
   - The media illumination lamp goes out.

S e n s o r G a i n
[R e a d j u s t G a i n a

[Readjust Gain and Press ↓ or Power Off]

15) Turn the power switch OFF.

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2. Adjustment of the Carriage Drive Belt Tension

Follow the procedure below to adjust the tension of the carriage drive belt.

a. Adjustment of the right pulley inclination

1) Turn the tension stopper of the right pulley, and set to middle of the three tension stages.

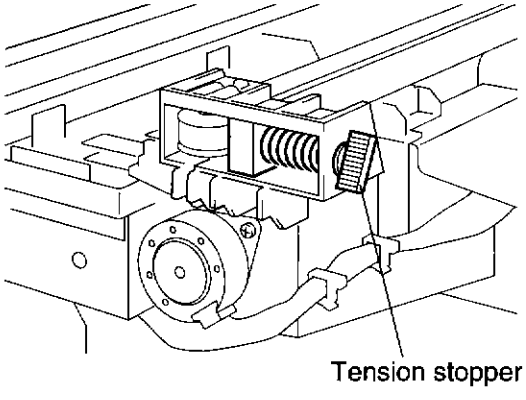

Figure 5-206

2) Move the carriage forwards or backwards by hand. During this operation, make sure that the carriage drive belt moves up and down above the right pulley.

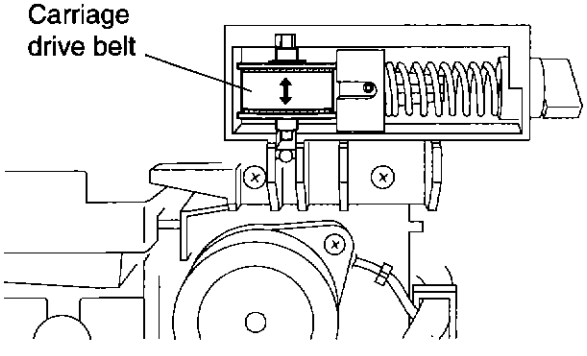

Figure 5-207

3) If the carriage drive belt does not move up or down, and stays above or below the right pulley, turn the set screw on the right pulley mount, and adjust the inclination of the right pulley so that the carriage drive belt moves up and down.

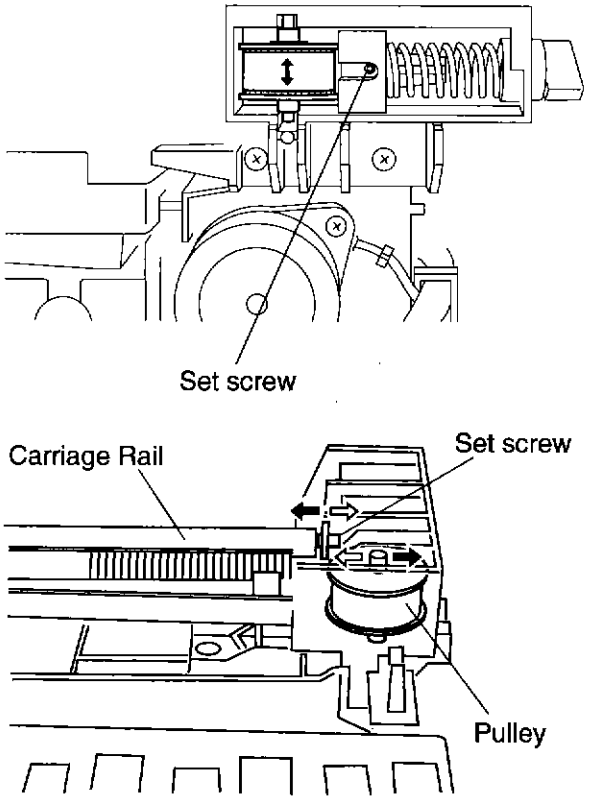

Figure 2-208

b. Adjustment of the left pulley inclination

1) Move the carriage forwards and backwards by hand. During this operation, make sure that the carriage drive belt moves up and down above the left pulley. If the carriage drive belt does not move up or down, and stays above or below the left pulley, follow the procedure below to adjust the inclination.

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2) Loosen the three screws on the left pulley cover.

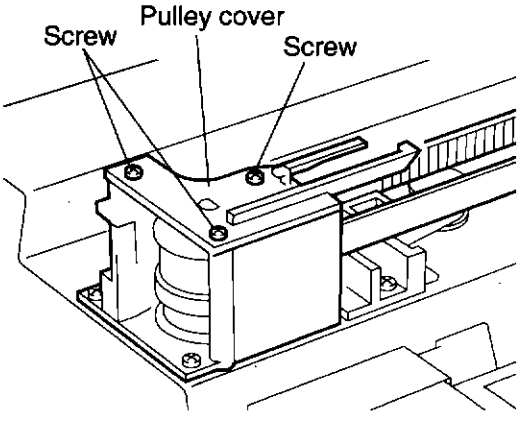

Figure 5-209

3) Turn the adjusting screw while moving the carriage forwards and backwards by hand so that the carriage drive belt moves up and down.

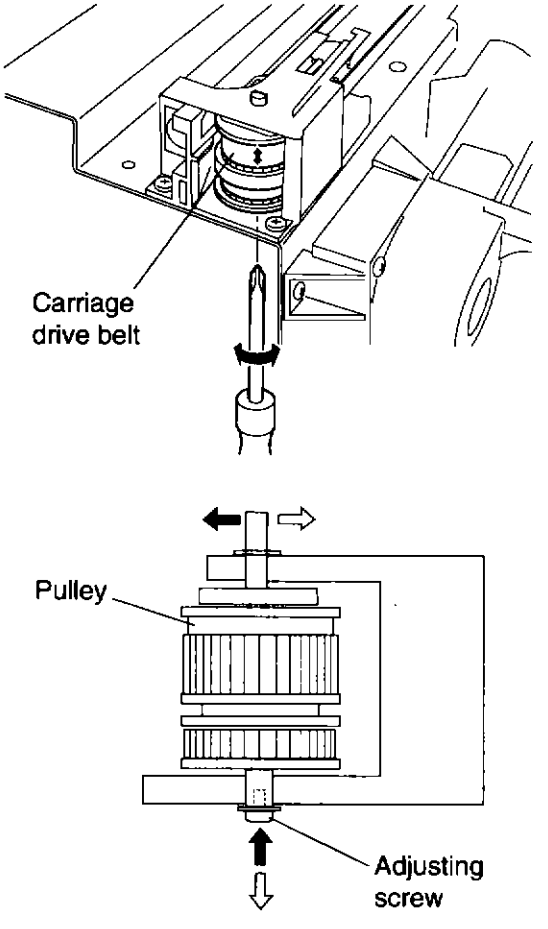

Figure 5-210

4) Tighten the three screws on the left pulley cover.

c. Adjustment of the belt tension

1) Move the carriage so that it comes up against the left of the printer.
2) Hook the spring gauge onto the center of the front carriage drive belt.
3) Pull the spring gauge to the rear, and measure the value at the position where the front and rear carriage drive belts touch each other.

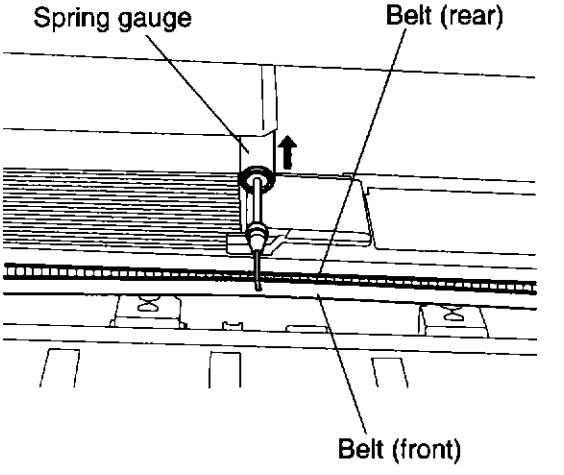

Figure 5-211

4) If the measured value is within the range 550 ±50g, change the position of the tension stopper on the right pulley to adjust the tension of the belt.
5) Measure the tension of the belt again.
6) If the tension is still lax after changing the position of the tension stopper, change the installation positions of the carriage drive belt to change the tension of the belts.

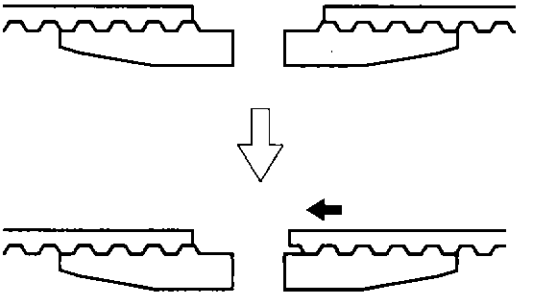

Figure 5-212

7) Check the inclination of the left and right pulleys to make sure that adjustments are completed.

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B. Electrical System

1. Adjustment of the Media Retainer Hook Position

Carry out this adjustment after the engine controller PCB has been replaced.

Adjusting the position of the media retainer hook adjusts the position where the carriage stops when the media retainer is hooked.

1) Set the printer to the service mode, and select "Mdia Guide Adjst."
(Refer to page 5-43 about Service Mode descrivibing below)

M d i a G u i d e A d j s t N o

2) Select "Yes" and press the down arrow key.

M d i a G u i d e A d j s t [O p e n L e f t C o v e r

[Open Left Cover and Press ↓]

3) Remove the left cover, and set the cover switch jig.

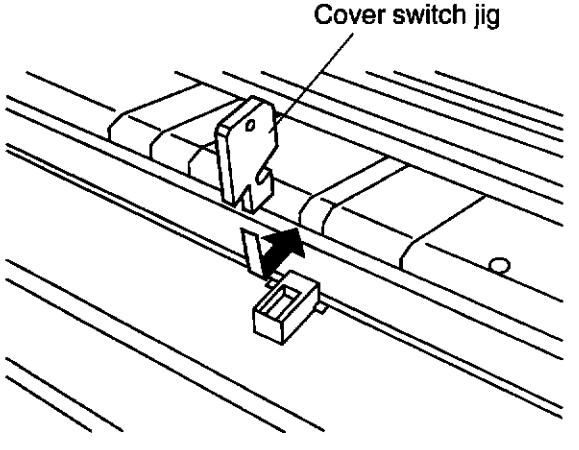

Figure 5-213

4) Press the down arrow key.

M d i a G u i d e A d j s t [S e t C a r r i a g e a n

[Set Carriage and Press ↓]

5) Move the carriage by hand to the media retainer position.

6) With the plunger on the media retainer solenoid pressed in, gently move the carriage until it lightly contacts the media retainer.

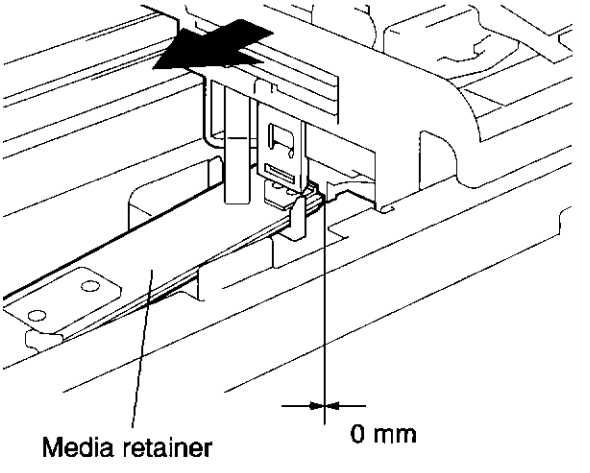

Figure 5-214

7) Remove hand from the plunger and lower the media retainer.
8) Press the down arrow key.
   - The solenoid turns ON and carriage moves slightly. Make sure that the media retainer is hooked by the carriage.
9) Install the left cover.

2. Adjustment of the Media Sensor Gain

This adjustment adjusts the lamp intensity and the sensitivity of the media sensor at auto head adjustment. Carry out this adjustment after the engine controller PCB or the following parts have been replaced:

- Carriage PCB
- DC power supply PCB
- Media sensor

This adjustment must also be carried out after the carriage or platen has been removed.

CAUTION
Clean the media sensor before adjusting this adjustment.
During this adjustment, do not touch the media sensor with your hands.

1) Remove all cartridges.
2) Set the cartridge height adjustment lever to the right position (O).

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3) Remove the expansion cover and right cover.

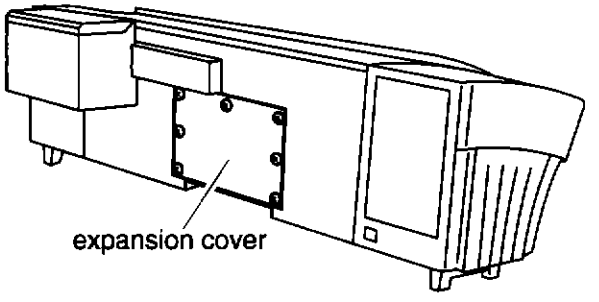

Figure 5-215

4) Remove two mounting screws, and protection sheet.

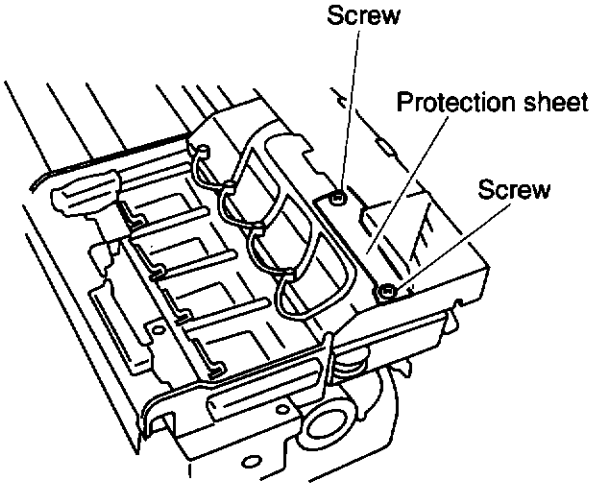

Figure 5-216

5) Remove long flexible cable and flexible mylar from from carriage covers hooks.

6) Remove mounting screw, and remove the volume cover while moving tubes.

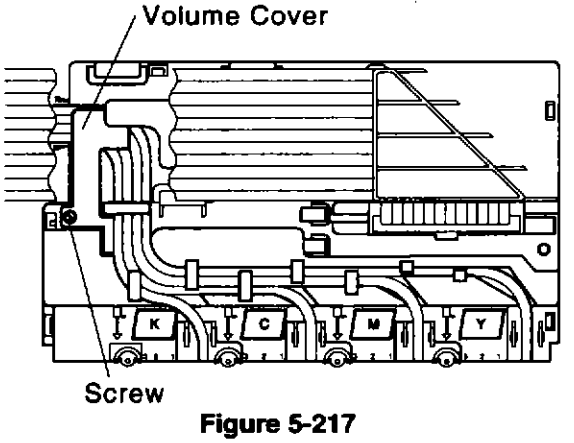

Figure 5-217

7) Fix the long flexible cable, flexible mylar and tubes using tape.

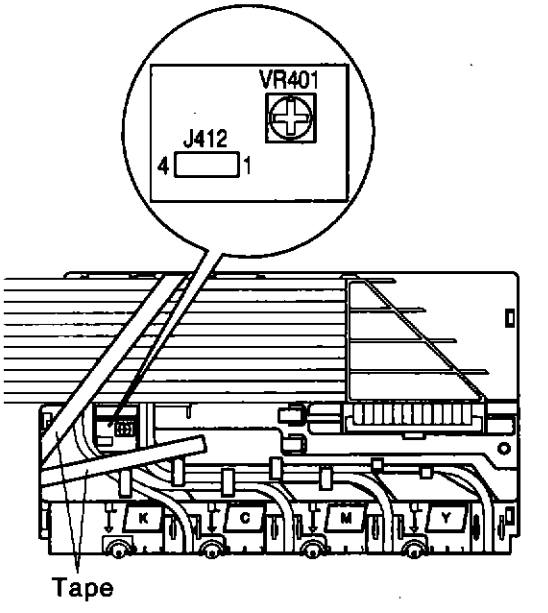

Figure 5-218

8) Insert the cover switch jig.

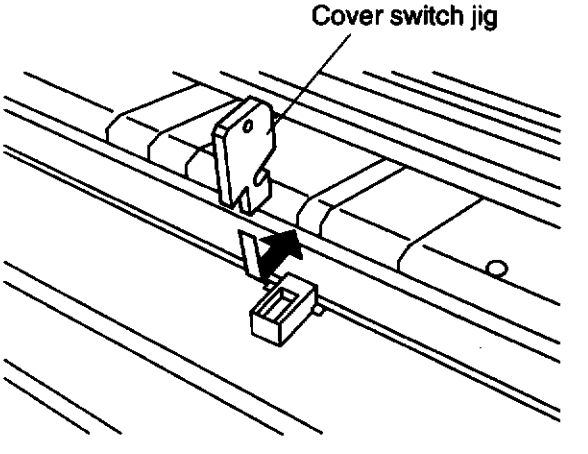

Figure 5-219

9) Set the printer to the service mode, and select "Sensor Gain."
(Refer to page 5-43 about Service Mode descrivibing below)

S e n s o r G a i n N o

10) Select "Yes" and press the down arrow key.

S e n s o r G a i n [P l e a s e L o a d M e d

[Please Load Media]

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11) Insert the cut sheet media into the printer.
- The printer feeds the media. The carriage moves over the media, and the media illumination lamp lights.

```
S e n s o r   G a i n
[ A d j u s t   V R .   T h e n
```

[Adjust VR. Then Press ↓]

CAUTION
Use plain paper only.

12) Set the tester to the volt range, and connect to J412-3 (+) and J412-4(-) on the carriage PCB.
13) In this state, adjust VR202 on the engine controller PCB so that the voltage across these terminals is the value shown in Table 5-201.

Lamp intensity at auto head adjustment	VR	+	-	Voltage
	VR202	J412-3	J412-4	16.5±0.1V

Table 5-201

14) Connect the tester to J412-2 (+) and J412-4 (-).
15) In this state, adjust VR401 on the carriage PCB so that the voltage across these terminals is the value shown in Table 5-202.

Sensor sensitivity at auto head adjustment	VR	+	-	Voltage
	VR401	J412-2	J412-4	12.0±0.1V

Table 5-202

16) Press the down arrow key.
- The media illumination lamp goes out.

```
S e n s o r   G a i n
[ R e a d j u s t   G a i n   a
```

[Readjust Gain and Press ↓ or Power Off]

17) Press the down arrow key again to light the lamp.
18) Carry out the adjustment in step 13) to 15).

CAUTION
VR401 becomes stable after being adjusted two or three times. After the adjustment, repeat steps 13) to 15) to check the adjusted values.

19) Turn the power switch OFF and remove the media.

3. Adjustment of the Media Sensor Light Intensity

This adjustment adjusts the lamp intensity of the media sensor at media detection. Carry out this adjustment after the engine controller PCB or the following parts have been replaced:
- Carriage PCB
- DC power supply PCB
- Media sensor

This adjustment must also be carried out after the carriage or platen has been removed.

CAUTION
Clean the media sensor and platen before adjusting this adjustment.
During this adjustment, do not touch the media sensor with your hands.

1) Remove all cartridges.
2) Set the cartridge height adjustment lever to the right position (O).
3) Remove the expansion cover and right cover.

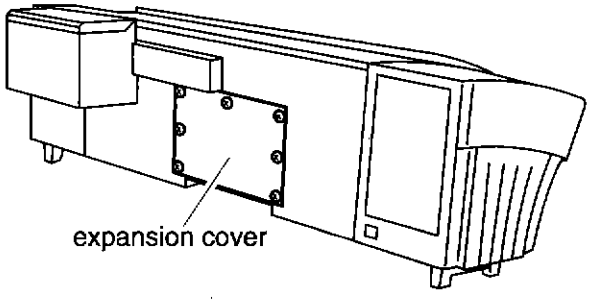

Figure 5-220

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4) Remove two mounting screws, and protection sheet.

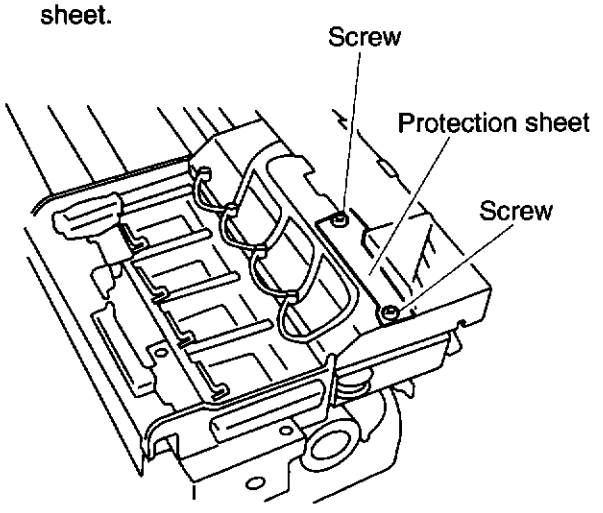

Figure 5-221

5) Remove mounting screw, and remove the volume cover while moving tubes.
6) Remove mounting screw, and remove the volume cover while moving tubes.

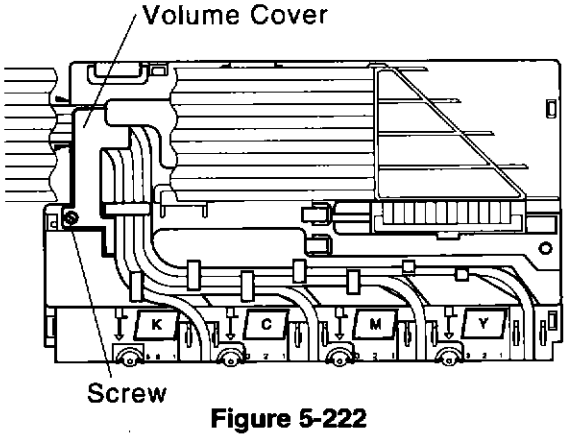

Figure 5-222

7) Fix the long flexible cable, flexible mylar and tubes using tape.

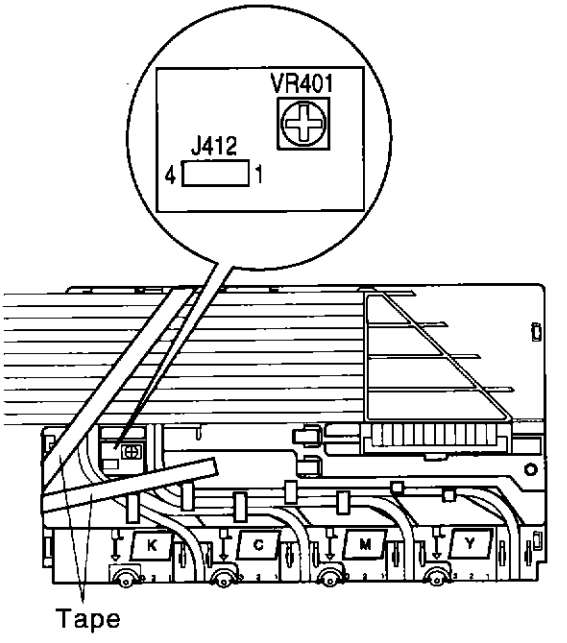

Figure 5-223

8) Insert the cover switch jig.

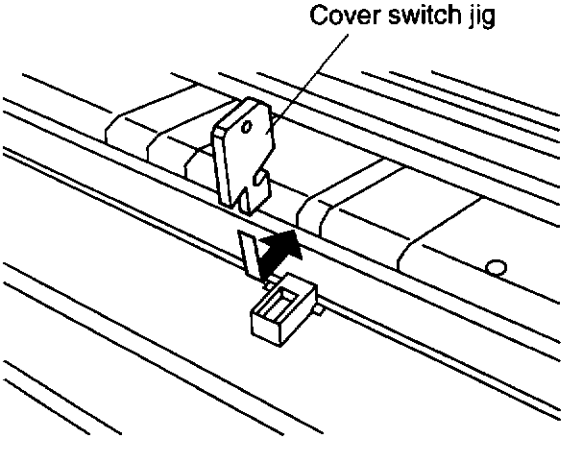

Figure 5-224

9) Set the printer to the service mode, and select "Sensor Light Adj."
(Refer to page 5-43 about Service Mode descrivibing below)

Sensor Light Adj No

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10) Select "Yes" and press the down arrow key.
- The carriage moves to the right end of the platen, and the media illumination lamp lights.

Sensor Light Adj
[Adjust VR. Then

[Adjust VR. Then Open/Close Dust Cover]

11) Set the tester to the volt range, and connect the tester to J412-1 (+) and J412-4 (-) on the carriage PCB.
12) In this state, adjust VR201 on the engine controller PCB so that the voltage across these terminals in the value shown in Table 5-203.

Lamp intensity at media detection	VR	+	-	Voltage
	VR201	J412-1	J412-4	2.0±0.05V

Table 5-203

13) Remove the tester from J412 on the carriage PCB.
14) Remove the cover switch jig, then insert again.
- The carriage moves to the left end of the platen, and the media illumination lamp lights.

Sensor Light Adj
[Adjust VR. Then

[Adjust VR. Then Press ↓]

15) In this state, check that the voltage between J412-1 (+) and J412-4 (-) is below 2.5 V.
If the voltage is 2.5 V or more, adjust the VR201 so that the voltage becomes 2.2 ±0.05 V.
16) Press the down arrow key.
- The media illumination lamp goes out, and the carriage returns to its home position.

4. Compensation of the Media Length

Carry out this adjustment after the engine controller PCB has been replaced.

When feeding cut sheet media, the length of the media is calculated from the feed amount up to when the media passes the cut sheet trailing edge sensor. This adjustment compensates for unevenness of the installation position of the cut sheet trailing edge sensor.

1) Set the printer to the service mode, and select "Media Size Adjst."
(Refer to page 5-43 about Service Mode descrivibing below)

Media Size Adjst
No

2) Select "Yes" and press the down arrow key.

Input Mdia Lngth
420.0mm 16.53In.

3) Prepare A3/11"×17" size media, and measure the length along its long side.
4) Press the left or right key, to select the length of the measured media.
5) Press the down arrow key.

Input Mdia Lngth
[Load Cut Sheet

[Load Cut Sheet Media]

6) Feed this media vertically into the printer.
- The printer determines the compensation value from the selected length and the length of the inserted media.
- The printer displays the "Margin Adjust" menu screen.

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5. Compensation of the Margins

Carry out this adjustment after the engine controller PCB has been replaced.

This adjustment compensates three margins: leading edge margin, left margin and trailing edge margin.

Adjusting the leading edge margin compensates for unevenness of the media discharge sensor installation position. Adjusting the left margin compensates for unevenness of the distance between the cartridge and media sensor. Adjusting the trailing edge margin compensates for unevenness of the Y cutter installation position.

CAUTION

The left margin is the margin on the left of the image, and is the margin on the right (carriage side) of the machine.

1) Set the printer to the service mode, and select "Margin Adjust."
(Refer to page 5-43 about Service Mode descrivibing below)

```
Margin Adjust
              No
```

2) Select "Yes" and press the down arrow key.

```
Margin Adjust
[Load Cut Sheet
```

[Load Cut Sheet Media]

3) Insert A3/11"×17" size or larger size cut sheet media into the printer.
   - The printer outputs the margin adjustment pattern, and cuts the media.
   - The screen for selecting the leading edge margin is displayed.

```
Input Top Margin
30.0mm    11.8In.
```

4) Measures the lengths of the leading edge, left and trailing edge margins from the output.

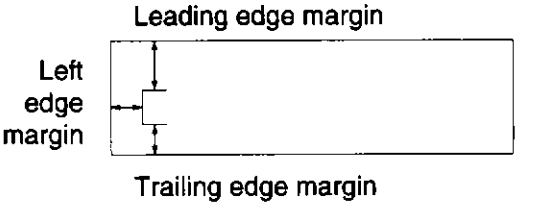

Figure 5-225

5) Press the left or right key to select the length of the measured leading edge margin.

Reference

The variable width is 0.1 mm/0.01".

6) Press the down arrow key.
   - The screen for selecting the left margin is displayed.

```
Input Left Mrgin
10.0mm    0.39In.
```

7) Press the left or right key to select the length of the measured left margin.
8) Press the down arrow key.
   - The screen for selecting the trailing edge margin is displayed.

```
Input Bttm Mrgin
10.0mm    0.39In.
```

9) Press the left or right key to select the length of the measured trailing edge margin.
10) Press the down arrow key.
   - The printer determines the compensation value from the selected margin lengths.
   - The printer displays the "Input Room Temp." menu screen.

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6. Compensation of the Room Temperature Thermistor

Carry out this adjustment and compensate for uneven precision of the thermistor on the volume PCB after the engine controller PCB or the following parts have been replaced.

- Carriage PCB
- DC power supply PCB
- Volume PCB

1) Set the printer to the service mode, and select "Input Room Temp."
(Refer to page 5-43 about Service Mode descrivibing below)

```
Input Room Temp.
23.0°C  73.4°F
```

Reference

The temperature currently detected by the printer is displayed on the message display.

2) Measure the room temperature using a thermometer.
3) Press the left or right arrow key to select the measured temperature.
4) Press the down arrow key.
   - The printer determines the compensation value from the selected temperature.

7. Compensation of the Head Temperature Sensor

Carry out this adjustment after the engine controller PCB or the following parts have been replaced. This adjustment compensates the reference value for the head temperature sensor inside the bubble jet cartridge.

- Carriage PCB
- DC power supply PCB

CAUTION

If you turn the cartridge fixing knob with the cover switch jig inserted, this may damage the carriage PCB.
To prevent mis-operating, do not use the cover switch jig during carrying out this adjustment.

1) Set the printer to the service mode, and select "Head Rank Adjust."
(Refer to page 5-43 about Service Mode descrivibing below)

```
Head Rank Adjust
No
```

2) Select "Yes" and press the down arrow key.
   - The carriage moves to the cartridge replacement position.

```
Head Rank Adjust
[Open Dust Cover
```

[Open Dust Cover]

3) Open the dust cover.

```
Head Rank Adjust
[Replace All Hea
```

[Replace All Head to Rank Adjust Jig and Close Dust Cover]

4) Remove all cartridges, and install the head temperature sensor adjustment jig at the Bk position.

Reference

This adjustment can also be carried out with all four head temperature sensor adjustment jigs attached.

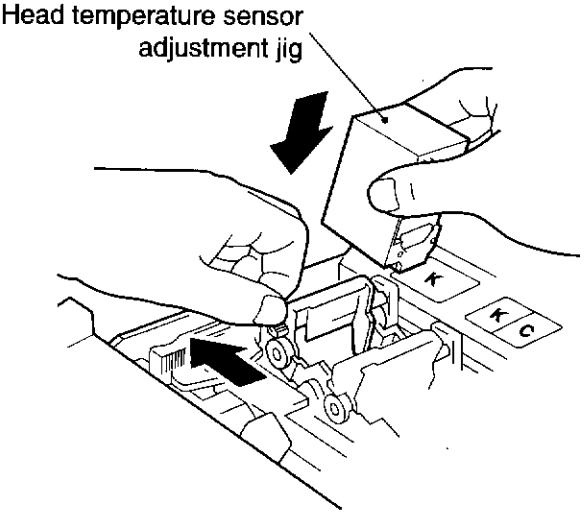

Figure 5-226

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5) Close the dust cover.
   - The carriage returns to its home position, and the compensation values of the head temperature sensors are determined.

H e a d R a n k A d j u s t
[A d j u s t i n g H e a d

[Adjusting Head Rank: Don't Open Dust Cover]

CAUTION
Do not open the dust cover while this message is displayed.

   - When the compensation values of the head temperature sensors are determined, and written to the engine controller, the media retainer solenoid is turned ON once.

E R R O R 0 o 1 X 2 X 3 X
[D I R a n k A d j u s t

[DI Rank Adjustment failed on 'X' Head. Press ONLINE to Continue]

CAUTION
An error is displayed when this adjustment is carried out without the four head temperature sensor adjustment jigs installed or when an erroneous jig is used.
However, even if an error is displayed, completion marks "O" are displayed at the top right of the message display at the side of the number corresponding to the positions of cartridges whose compensation values have been successfully determined and written internally by the printer.
In this case, "0" refers to the position of the cartridge "Bk", "1" to "C", "2" to "M" and "3" to "Y".

6) Press the ONLINE key.
   - The printer leaves the error mode.

H e a d R a n k A d j u s t
[A d j u s t m e n t C o m p

[Adjustment Completed. Press ↓]

7) Press the down arrow key.
   - The carriage moves to the cartridge replacement position, and the menu screen is redisplayed.

C l e a r W a s t e T a n k
N o

8) Press the up arrow key, and select "Head Rank Adjust."

H e a d R a n k A d j u s t
N o

9) Repeat steps 2) to 8) and carry out the same adjustment on the positions of the three Cyan, Magenta and Yellow cartridges.

CAUTION
Completion marks "O" displayed for each of the cartridge positions indicate that the adjustment is completed even if an error is displayed.

10) Remove the head temperature sensor adjustment jig.

8. Clearing the Waste Ink Counter

The waste ink counter must be cleared to "0" after the waste ink tank has been replaced.

The waste ink counter must be cleared and the waste ink tank replaced at the same time.

CAUTION
If a malfunction has cleared the waste ink counter, the waste ink tank must be replaced with a new one.

Reference

The value of the waste ink counter can be checked by Setup List.

1) Set the printer to the service mode, and select "Clear Waste Tank."
(Refer to page 5-43 about Service Mode descrivibing below)

C l e a r W a s t e T a n k
N o

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2) Open the dust cover.
3) Select "Yes" and press the down arrow key.
   • The confirmation message is displayed.

Really Clear?
←Yes Clear? No→

4) Press the left arrow key to select "Yes."
   • The waste ink counter is cleared.

Reference

To cancel clearing of the waste ink counter, press the right arrow key to select "No.".

Clear Waste Tank
[Tank Level Coun

[Tank Level Count Cleared : Turn Power Off]

5) Turn the power switch OFF, and replace the waste ink tank.

9. Procedures after Replacing the Engine Controller PCB

Carry out the following adjustments in the following order after replacing the engine controller PCB.

1) Setting SW201
   Make sure that the setting of SW201 on the engine controller PCB is as shown in Figure 5-227.

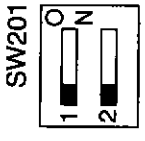

Figure 5-227

2) Adjustment of the media sensor gain
3) Adjustment of the media sensor light intensity
4) Adjustment of the media retainer hook position
5) Compensation of the room temperature thermistor
6) Compensation of the head temperature sensor
7) Compensation of the media length
8) Compensation of the margins

CAUTION

Carry out replacing the waste ink tank and clearing the waste ink counter after replacing engine controller PCB and image controller PCB at the same time.

10. Procedures after Replacing the Carriage PCB

Carry out the following adjustments in the following order after replacing the carriage PCB.

1) Adjustment of the media sensor gain
2) Adjustment of the media sensor light intensity
3) Compensation of the room temperature thermistor
4) Compensation of the head temperature sensor

11. Procedures after Replacing the DC Power Supply PCB

Carry out the following adjustments in the following order after replacing the DC power supply PCB.

1) Adjustment of the media sensor gain
2) Adjustment of the media sensor light intensity
3) Compensation of the room temperature thermistor
4) Compensation of the head temperature sensor

12. Procedure after Replacing the Volume PCB

Carry out the adjustment of the compensation of the room temperature thermistor after replacing the volume PCB.

13. Procedures after Replacing the Media Sensor

Carry out the following adjustments in the following order after replacing the media sensor.

1) Adjustment of the media illumination lamp optical axis
2) Adjustment of the media sensor gain
3) Adjustment of the media sensor light intensity

14. Procedure after Replacing the Media Illumination Lamp

Carry out the adjustment of the media illumination lamp optical axis after replacing the media illumination lamp.

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C. Communications

1. Selecting the Parallel Interface Communication Mode

One some computers that communicate with the printer in a compatible mode, can not communicate with this printer by the output timing of the computer's Busy and nAck signals.

On most computers, set the communication mode to "A-B". This setting, however, must be changed to the "A-B-A" or "B-A" mode when the printer's data reception indicator does not light even if data is being transferred.

1) Turn the power switch OFF.
2) Turn the power ON while holding down the ONLINE and MENU keys.
3) Make sure that "Busy-Ack" is displayed on the message display before releasing your fingers from the keys.
   - The printer enters the communication mode selection menu.

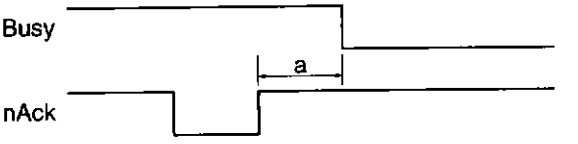
```
Busy-Ack
  A-B  (Default)
```

4) Press the left or right key to select the communication mode.
5) Press one of the ONLINE, MENU, up or down arrow key to confirm the setting.
   - The image controller PCB is initialized, and the printer exits the communication mode selection menu.

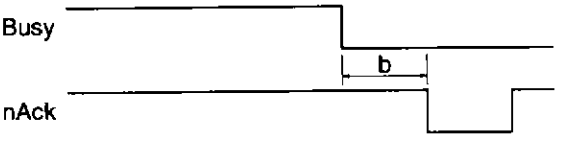
Reference

Figure 5-228 shows the relationship between the Busy and nAck signals in each mode.

A-B (Ack-in-Busy)



B-A (Ack-after-Busy)



A-B-A (Ack-while-Busy)

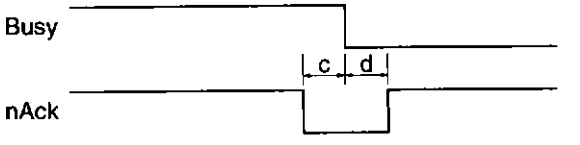


Figure 5-228

2. Upgrading the Image Controller Version

Follow the procedure below to download the upgrade version of the image controller firmware.

1) Turn the printer and computer power switches OFF.
2) Connect the printer to the computer via the interface cable.
3) Turn the printer's power switch ON while holding down the printer's left and right arrow keys.
4) Make sure that "Down Load Mode" is displayed on the message display before releasing your fingers from the keys.
   - The printer enters the download mode.

```
Down Load Mode
[Send File to Pa
```

[Send File to Parallel Port]

5) Turn the computer's power switch ON.
6) Insert the download disk into the disk drive.
7) Select the drive containing the disk.

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8) Enter the following at the command prompt. (In the following example, the computer's output port is set to LPT1.)

COPY/B file name LPT1:

9) Press the return key.
   - Data is downloaded from the computer.

```
Ver. 02. 01
      Receiving..
```

   - When the printer has finished receiving the data, the following message is displayed.

```
01. 01 -> 02. 01
[Press ↓ to Writ
```

[Press ↓ to Write File on Flash]

10) Press the down arrow key of the printer.
   - The image controller PCB deletes and overwrites data in flash memory.

```
Down Load Mode
[Update Complete
```

[Update Completed !! Please Power Off]

11) Turn the printer's power switch OFF.

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III. REMEDYING IMAGE DEFECTS

A. Initial Inspection

Broadly speaking, image defects are caused by the following four reasons:

- Defective printer operating environment
- Defective media type or state
- Defective bubble jet cartridge
- Defective printer body

Check the operating environment and state of the media at initial inspection.

1. Siting Environment

Check whether or not the operating environment matches the following operating environmental conditions.

a. Maintain the power voltage to within 90 to 264 V. Avoid sharing the power supply with other equipment.
b. The recommended operating environment for this printer is as follows:
   Temperature: 17.5 to 27.5°C
   Humidity: 25 to 75% (RH)
c. Avoid locations subject to sudden changes in temperature or humidity.
d. Avoid siting the printer in dusty locations.
e. Avoid the direct sunlight. Instruct the user to provide a curtain to shield the printer from direct sunlight if the printer must be sited in the direct sunlight.
f. Site the printer on a level location.
g. Avoid siting the printer in air emitted directly from electric fan or air conditioning equipment.

2. Checking the Media

The quality of prints made by a bubble jet printer is influenced greatly by the type and state of the media. So, inspect the state of the media loaded on the printer when making the initial inspection.

a. Is the recommended media in use?
b. Is the media stored in the appropriate environment?

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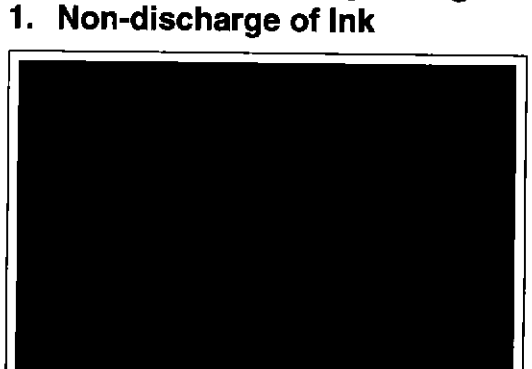
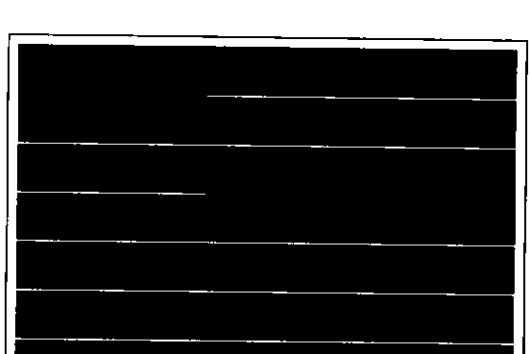
B. How to Remedy Image Defects

1. Non-discharge of Ink



Normal



Abnormal

Step	Cause	Remedy
1	No ink	See item "ink not supplied".
2	Clogged nozzles Foreign matter on head	Carry out head cleaning. If the problem is not improved by carrying out head cleaning twice, go to next step.
3	Defective wiper blade	Clean or replace wiper blade.
4	Defective head	Replace bubble jet cartridge.

2. Different-color Dot Shift

Step	Cause	Remedy
1	Foreign matter on head	Carry out head cleaning. If the problem is not improved by carrying out head cleaning twice, go to next step.
2	Faulty head adjustment setting	Carry out "Head (Auto)" or "Head (User)" adjustment. (See page 1-28.)
3	Faulty "Adjustment of the media sensor gain" setting	Carry out "Adjustment of the media sensor gain". (See page 5-7.)
4	Dirty media sensor	Clean media sensor.
5	Defective head	Replace bubble jet cartridge.

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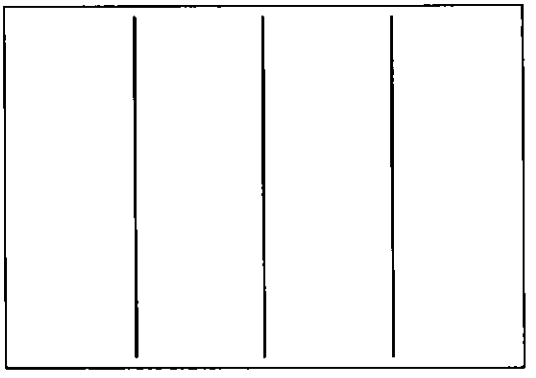
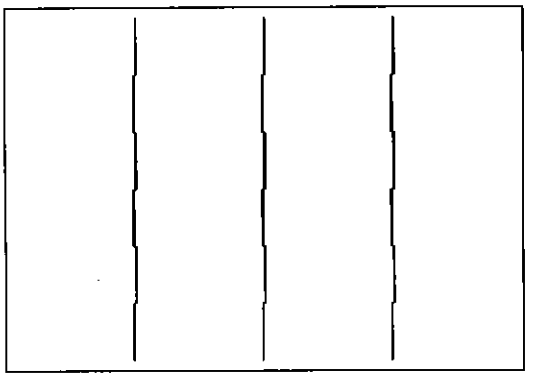
3. Jagged Lines



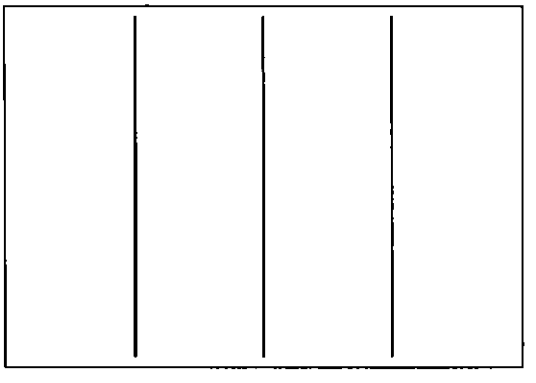
Normal



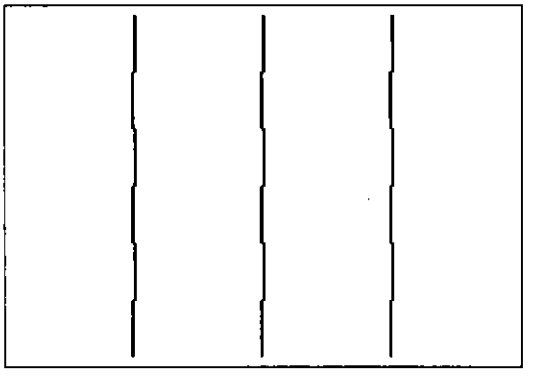
Abnormal

Step	Cause	Remedy
1	Faulty head adjustment setting	Carry out "Head (Auto)" or "Head (User)" adjustment. (See page 1-20.)
2	Print mode	Select uni-direction print mode. (See page 2-12.)
3	Defective head	Replace bubble jet cartridge.

4. Slant Lines



Normal



Abnormal

Step	Cause	Remedy
1	Defective installation angle of the bubble jet cartridge	Carry out "Cartridge angle adjustment. (See page 1-23.)

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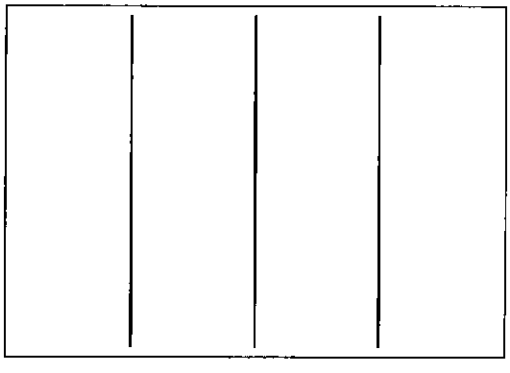
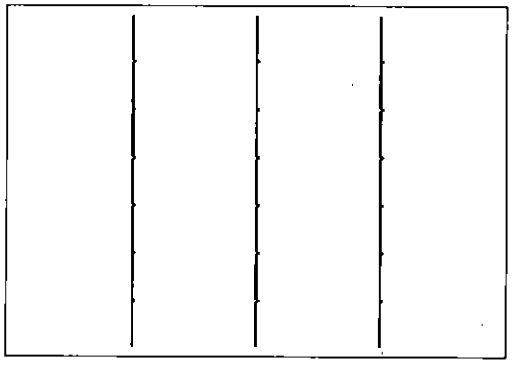
5. Dots are Small or Density is Low

Step	Cause	Remedy
1	Clogged nozzles Foreign matter on head	Carry out head cleaning. If the problem is not improved by carrying out head cleaning twice, go to next step.
2	Defective wiper blade	Clean or replace wiper blade.
3	Low printer operating temperature	Use under the recommended environment (temperature: 17.5 to 27.5°C, himidity: 25 to 75%).
4	Print mode	If this problem is conspicuous in 1-pass print mode, it is sometimes eliminated by the multi-pass print mode. (See page 2-12.)
5	Defective head	Replace bubble jet cartridge.

6. The Ink Discharge Position of a Specific Nozzle is Out of Position



Normal



Abnormal

Step	Cause	Remedy
1	Foreign matter on head	Carry out head cleaning. If the problem is not improved by carrying out head cleaning twice, go to next step.
2	Defective wiper blade	Clean or replace wiper blade.
3	Defective head	Replace bubble jet cartridge.

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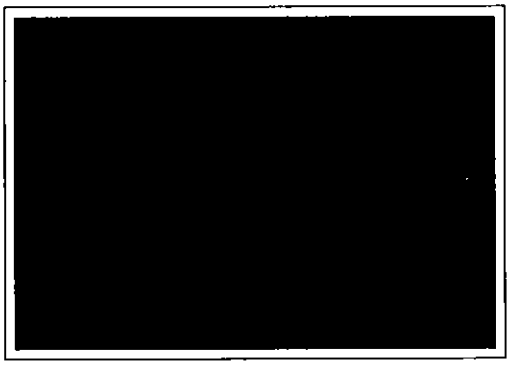
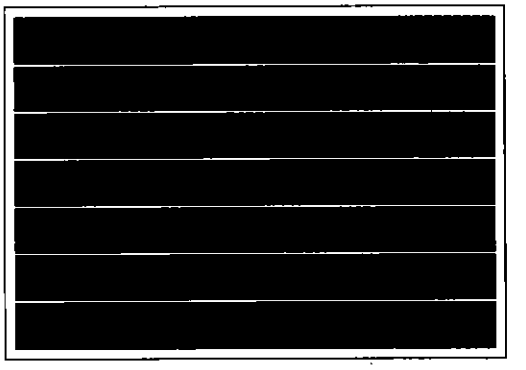
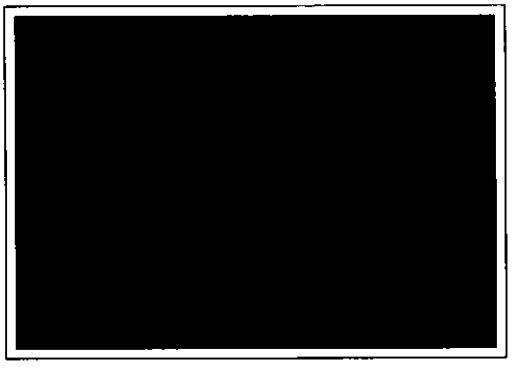
7. Stripes Appear in Y-axis



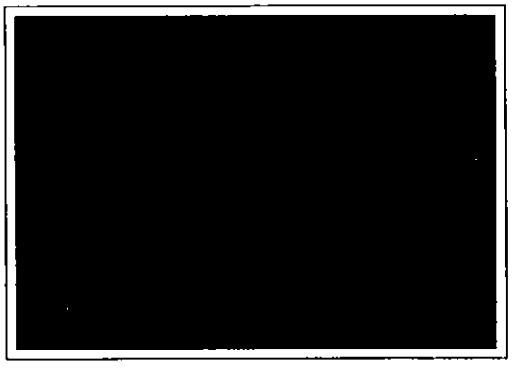
Normal



Abnormal



Normal



Abnormal

Step	Cause	Remedy
1	Non-discharge of ink	See "1. Non-discharge of Ink". (See page 5-18.)
2	Defective media feed amount	Carry out the adjustment "Band". (See page 1-29.)
3	Ink discharge position out of position	See "6. The Ink Discharge Position of a Specific Nozzle is Out of Position". (See page 5-20.)
4	Defective head	Replace bubble jet cartridge.

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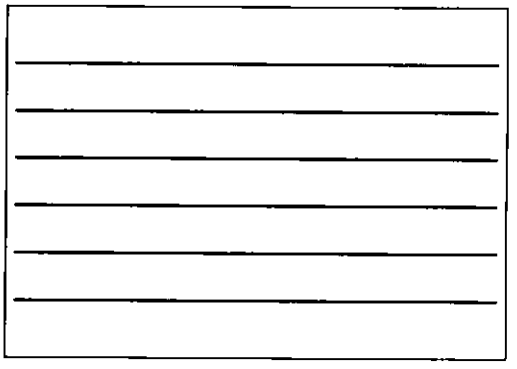
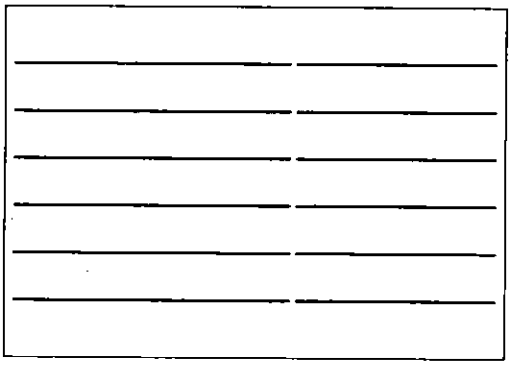
8. Stripes Appear in X-axis



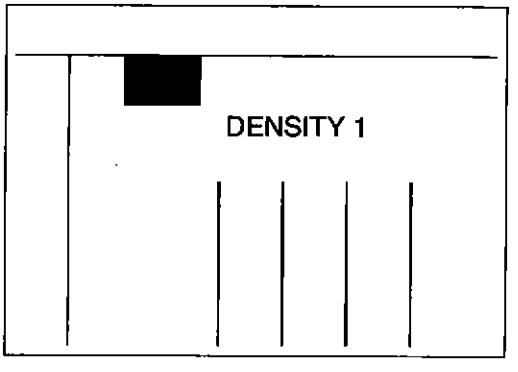
Normal



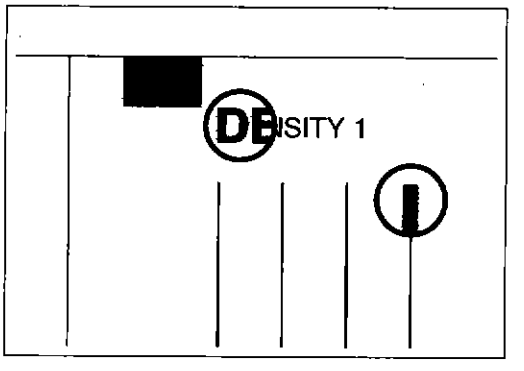
Abnormal

Step	Cause	Remedy
1	Defective linear encoder	Replace the linear encoder. (See page 3-9.)

9. Contours of Filled Images are Not Sharp



Normal



Abnormal

Step	Cause	Remedy
1	Ink easily runs on media in use	Use the recommended media. Or, use media that is less likely to run.
2	Print mode	Use the multi-pass print mode. (See page 2-12.)

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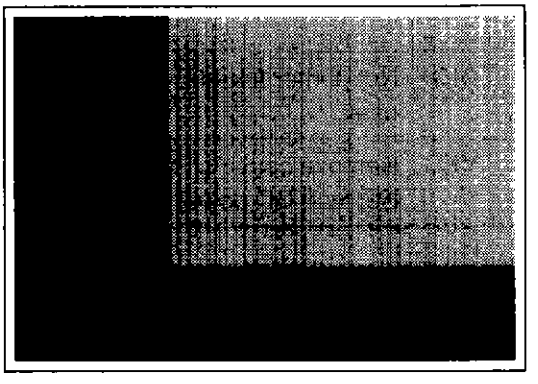
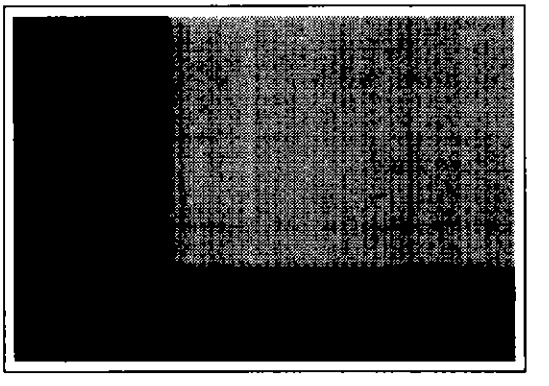
10. Defective Vertical Scaling/Defective Dimensional Accuracy

Step	Cause	Remedy
1	Media shrinkage	Acclimatize media to printer operating environment.
2	Defective media feed amount	Carry out the adjustment "Band". (See page 1-29.)

11. Smudging at the Boundary between Filled Images





Step	Cause	Remedy
1	Poor water absorption of media	Use media recommended. Use media with good water absorption characteristics.
2	Ink dries slowly.	Use the multi-pass print mode. (See page 2-12.)

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IV. REMEDYING DEFECTIVE OPERATION

A. How to Read the Troubleshooting Tables

The troubleshooting tables in this section are table representations of general-purpose flowcharts.
The following describes how to read a troubleshooting table taking "Power Does Not Turn ON" as an example.

EX. Power Does Not Turn ON.

Cause/Faulty Location	Step	Check Item	Result	Remedy
Disconnected power plug	1	Is the power plug inserted into the outlet?	NO	Insert the power plug.
No power supply	2	Is the rated voltage being supplied to outlet?	NO	Not printer trouble. Explain to user.
Blown fuse	3	Is fuse (F1) blown?	YES	Remove cause of blown fuse. Replace DC power supply PCB.

- To learn the probable causes of trouble, refer to the item "Cause/Faulty Location." In the "Power Does Not Turn ON" table above, probable causes are a disconnected power plug, no power supply and a blown fuse, or others.
- To learn how to remedy the trouble or learn the check procedure, you check the trouble following the numbered steps under "Step." And judge whether the answer to the questions under "Check Item" are "YES" or "NO." If your answer matches the entry under "Result," then carry out the remedy described under "Remedy." If your answer does not match the entry under "Result," proceed to the next step and check in the same way.

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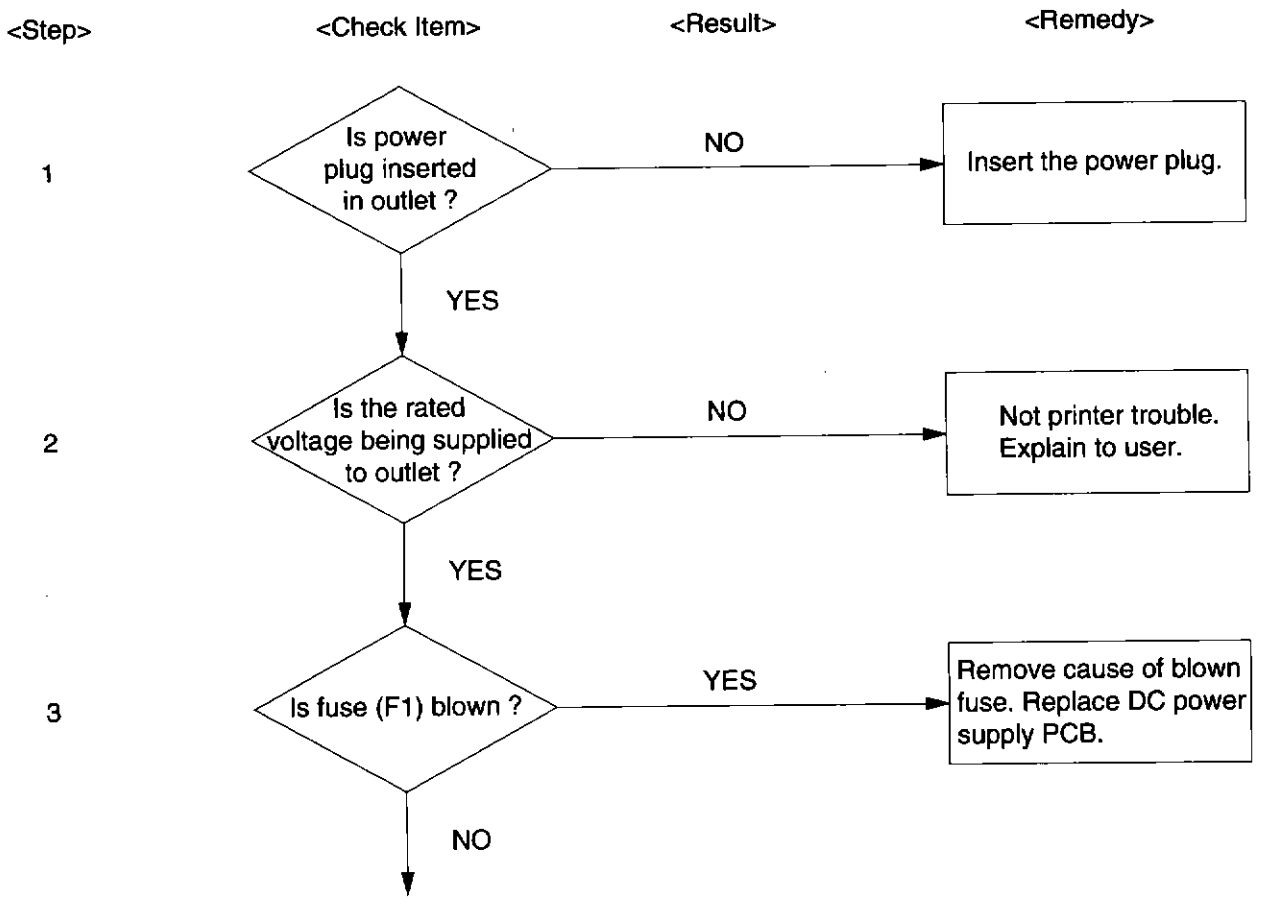

From here on can be omitted.

- When using a tester to check the voltage, a description such as "Measure the voltage across connectors J102-1 (+) and J102-2 (-) on the engine controller PCB." is written under "Check Item." (+) or (-) following the connector number refers to the terminal to which you connect the positive or negative probe of the tester.
  Example: 102-1 (+) ..... positive probe
  102-2 (-) ..... negative probe

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B. Procedure

1. Power Does Not Turn ON

<table>
<tr><th>Cause/Faulty Location</th><th>Step</th><th>Check Item</th><th>Result</th><th>Remedy</th></tr>
<tr><td>Disconnected power plug</td><td>1</td><td>Is the power plug inserted into the outlet?</td><td>NO</td><td>Insert the power plug.</td></tr>
<tr><td>No power supply</td><td>2</td><td>Is the rated voltage being supplied to outlet?</td><td>NO</td><td>Not printer trouble. Explain to user.</td></tr>
<tr><td>Blown fuse</td><td>3</td><td>Is fuse (F1) blown?</td><td>YES</td><td>Remove cause of blown fuse. Replace DC power supply PCB.</td></tr>
<tr><td>Power switch (SW1)</td><td>4</td><td>Connect the tester probes across terminals 2 and 3, and 5 and 6 on the power switch (SW1), and check electrical continuity when the power switch is turned ON.</td><td>NO</td><td>Replace power switch.</td></tr>
<tr><td>DC power supply PCB</td><td>5</td><td>Turn power switch OFF, and disconnect connectors J201 from the engine controller PCB and CN703 from the image controller PCB. Turn the power switch ON, and measure the voltage across the terminals shown in the following table. Are voltages normal?
<table><tr><th>+</th><th>–</th><th>Voltage</th></tr><tr><td>J201-4</td><td>J201-5</td><td>+24V</td></tr><tr><td>J201-2</td><td>J201-3</td><td>+5V</td></tr><tr><td>CN703-1</td><td>CN703-2</td><td>+5V</td></tr></table></td><td>NO</td><td>Replace DC power supply PCB.</td></tr>
<tr><td>Purge motor (M3)</td><td>6</td><td>Turn the power switch OFF, and insert connectors J201 and CN703. Does the purge motor (M3) operate when the power switch is turned ON?</td><td>NO</td><td>See item "Purge Unit Does Not Operate."</td></tr>
<tr><td>X-axis motor (M1)</td><td>7</td><td>Does carriage move after turning power ON?</td><td>NO</td><td>See item "Carriage Does Not Move."</td></tr>
<tr><td>Control panel PCB</td><td>8</td><td>Is problem solved by replacing control panel PCB?</td><td>YES</td><td>END</td></tr>
<tr><td>Image controller PCB</td><td rowspan="2">9</td><td rowspan="2">Is problem solved by replacing image controller PCB?</td><td>YES</td><td>END</td></tr>
<tr><td>Engine controller PCB</td><td>NO</td><td>Replace engine controller PCB.</td></tr>
</table>

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2. Media is Not Fed

<table>
<tr><th>Cause/Faulty Location</th><th>Step</th><th>Check Item</th><th>Result</th><th>Remedy</th></tr>
<tr><td></td><td>1</td><td>Is media fed to media discharge sensor?</td><td>YES</td><td>Go to Step 8.</td></tr>
<tr><td></td><td>2</td><td>Is cut sheet media fed?</td><td>YES</td><td>Go to step 4.</td></tr>
<tr><td>Cut sheet detection sensor (PS1)
Cut sheet trailing edge sensor (PS7)</td><td>3</td><td>Set the tester range to 12 VDC, and connect the tester probes to J207-A2 (+) (CTPSET) and J207-A1 (-), and J207-B11 (+) (ENDPSN) and J207-B10 (-) on the engine controller PCB. Does the voltage change from 5 V to 0 V when cut sheet media is inserted into the media feed inlet in the cut sheet media mode?</td><td>NO</td><td>Check wiring. If normal, replace sensor.</td></tr>
<tr><td>Roll media detection sensor (PS2)</td><td>4</td><td>Set the tester range to 12 VDC, and connect the tester probes to J207-A5 (+) (RLPSET) and J207-A4 (-) on the engine controller PCB. Does the voltage change from 5 V to 0 V when roll media is inserted into the media feed inlet in the roll media mode?</td><td>NO</td><td>Check wiring. If normal, replace sensor.</td></tr>
<tr><td>Media feed detection sensor (PS8)</td><td>5</td><td>Is the problem solved by replacing media feed detection sensor (PS8)?</td><td>YES</td><td>END</td></tr>
<tr><td>X-axis motor (M1)</td><td>6</td><td>Turn the power switch OFF, then disconnect J305 from the motor driver PCB. Set the tester range to x10Ω, and measure the resistances across the motor connector terminals shown in the following table. Are resistances normal?
<table>
<tr><th></th><th></th><th>Resistance</th></tr>
<tr><td>J305-3</td><td>J305-4</td><td>Approx. 9.0 Ω</td></tr>
<tr><td>J305-5</td><td>J305-6</td><td>Approx. 9.0 Ω</td></tr>
<tr><td>J305-3</td><td>J305-1</td><td>Approx. 4.5 Ω</td></tr>
<tr><td>J305-4</td><td>J305-1</td><td>Approx. 4.5 Ω</td></tr>
<tr><td>J305-5</td><td>J305-2</td><td>Approx. 4.5 Ω</td></tr>
<tr><td>J305-6</td><td>J305-2</td><td>Approx. 4.5 Ω</td></tr>
</table></td><td>NO</td><td>Replace X-axis motor.</td></tr>
</table>

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Cause/Faulty Location	Step	Check Item	Result	Remedy
Motor controller PCB	7	Is the problem solved by replacing the motor controller PCB?	YES	END
Media discharge sensor (PS6)	8	Set the tester range to 12 VDC, and connect the tester probes to J207-B8 (+) (OUTPSN) and J207-B7 (-) on the engine controller PCB. Does the voltage change from 5 V to 0 V when put media over the detecting lever assembly of media discharge sensor?	NO	Check wiring. If normal, replace sensor.
Engine controller PCB			YES	Replace engine controller PCB.

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3. Carriage Does Not Move

<table>
<tr><th>Cause/Faulty Location</th><th>Step</th><th>Check Item</th><th>Result</th><th>Remedy</th></tr>
<tr><td>Carriage drive belt</td><td>1</td><td>Is the carriage drive belt properly attached?</td><td>NO</td><td>Attach properly.</td></tr>
<tr><td>Dust cover switch (SW2)</td><td>2</td><td>Turn the power switch OFF, and disconnect connector J26. Connect the tester probes to switch side terminal. Do the resistances change from 0Ω to ∞Ω when the dust cover is closed of opened?</td><td>NO</td><td>Check wiring. If normal, replace switch.</td></tr>
<tr><td>Carriage home position sensor (PS3)</td><td>3</td><td>Set the tester range to 12 VDC, and connect the tester probes to J207-A8 (+) (CRGHP) and J207-A7 (-) on the engine controller PCB. Is the voltage 5 V when the carriage is at its home position?</td><td>NO</td><td>Check wiring. If normal, replace sensor.</td></tr>
<tr><td>Feeder open/close sensor (PS9)</td><td>4</td><td>Set the tester range to 12 VDC, and connect the tester probes to J204-4 (+) (PRSSEN) and J204-3 (-) on the engine controller PCB. Does the voltage change from 0 V to 5 V when the feeder unit is released?</td><td>NO</td><td>Check wiring. If normal, replace sensor.</td></tr>
<tr><td>Y-axis motor(M2)</td><td>5</td><td>Is the problem solved by replacing the Y-axis motor?</td><td>YES</td><td>END</td></tr>
<tr><td>Motor controller PCB</td><td>6</td><td>Is the problem solved by replacing the motor controller PCB?</td><td>YES</td><td>END</td></tr>
<tr><td>Linear encoder</td><td>7</td><td>Is the problem solved by replacing the linear encoder?</td><td>YES</td><td>END</td></tr>
<tr><td>Long flexible cable</td><td>8</td><td>Disconnect J206 from the the engine controller PCB and J405 from the carriage PCB. Is there electrical continuity across the long flexible cable terminals shown in the following table?<table><tr><td></td><td></td><td></td></tr><tr><td>LHA</td><td>J206-35</td><td>J405-35</td></tr><tr><td>LHB</td><td>J206-36</td><td>J405-36</td></tr></table></td><td>NO</td><td>Replace long flexible cable.</td></tr>
<tr><td>Carriage PCB</td><td rowspan="2">9</td><td rowspan="2">Is the problem solved by replacing the carriage PCB?</td><td>YES</td><td>END</td></tr>
<tr><td>Engine controller PCB</td><td>NO</td><td>Replace engine controller PCB.</td></tr>
</table>

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4. Purge Unit Does Not Operate

Cause/Faulty Location	Step	Check Item	Result	Remedy
Drive	1	Is rotation of the purge motor being transmitted to the cap cam via the gear?	NO	Check for damaged gears or defective installation.
Purge motor (M3)	2	Is problem solved by replacing purge motor (M3)?	YES	END
Cap cam home position sensor (PS5)	3	Set the tester range to 12 VDC, and connect the tester probes to relay connector J5-5 (+) (VACSEL) and J5-4 (-) . Does the voltage change from 0V to 5V when turning the drive gear on the purge unit?	NO	Check wiring. If normal, replace sensor.
Pressure cam home position sensor (PS4)	4	Set the tester range to 12 VDC, and connect the tester probes to relay connector J5-3 (+) (VCAMHP) and J5-2 (-) on the engine controller PCB. Does the voltage change from 0V to 5V when turning the drive gear on the purge unit?	NO	Check wiring. If normal, replace sensor.
Ink detection PCB	5	Is problem solved by replacing ink detection PCB?	YES	END
Engine controller PCB			NO	Replace engine controller PCB.

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5. Path Change Plate Does Not Operate

Cause/Faulty Location	Step	Check Item	Result	Remedy
Cut sheet position switch (MSW1), Roll media position switch (MSW2)	1	Turn the power switch OFF, and remove cut sheet position switch (MSW1) and roll media position switch (MSW2). Connect the tester probes across both switch terminals. Is the resistance ∞Ω when the switch actuator is moved to the left and right, and 0Ω when the actuator is at the center?	NO	Replace switch.
Path change motor (M4)	2	Is the problem solved by replacing path change motor (M4)?	YES	END
Ink detection PCB	3	Is the problem solved by replacing the ink detection PCB?	YES	END
Engine controller PCB			NO	Replace engine controller PCB.

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6. No Display on Control Panel

Cause/Faulty Location	Step	Check Item	Result	Remedy
Connector	1	Is control panel connector connected firmly to image controller PCB?	NO	Connect connector.
Operation PCB	2	Is problem solved by replacing Operation PCB.	YES	END
Image controller PCB			NO	Replace image controller PCB.

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7. Head Error Message Does not Disappear

Cause/Faulty Location	Step	Check Item	Result	Remedy
Defective cartridge installation	1	Is the bubble jet cartridge properly attached?	NO	Properly attach cartridge.
Defective cartridge	2	Is problem solved by replacing the cartridge?	YES	END
Dirty short flexible cable	3	Signal contacts of cartridge with short flexible cable dirtied by ink?	YES	Clean contacts.
Long flexible cable	4	Is problem solved by replacing long flexible cable?	YES	END
Carriage PCB	5	Is problem solved by replacing carriage PCB?	YES	END
Engine controller PCB	6	Is problem solved by replacing engine controller PCB?	YES	END
Image controller PCB	7	Is problem solved by replacing image controller PCB?	YES	END
Short flexible cable			NO	Replace short flexible cable.

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8. Jam Message Does Not Disappear

<table>
<tr><th>Cause/Faulty Location</th><th>Step</th><th>Check Item</th><th>Result</th><th>Remedy</th></tr>
<tr><td>Remaining media</td><td>1</td><td>Media remaining in transport path?</td><td>YES</td><td>Remove remaining media.</td></tr>
<tr><td>Cut sheet detection sensor (PS1)
Roll media detection sensor (PS2)
Media discharge sensor (PS6)
Cut sheet trailing edge sensor (PS7)</td><td rowspan="2">2</td><td rowspan="2">Set the tester range to 12 VDC, and connect the tester probes across the terminals shown in the following table. Does the voltage change to 0 V from 5 V when media is inserted at each of the sensors?
<table><tr><th></th><th>+</th><th>–</th></tr><tr><td>PS1</td><td>J207-A2</td><td>J207-A1</td></tr><tr><td>PS2</td><td>J207-A5</td><td>J207-A4</td></tr><tr><td>PS6</td><td>J207-A8</td><td>J207-A7</td></tr><tr><td>PS7</td><td>J207-B11</td><td>J207-B10</td></tr></table></td><td>NO</td><td>Check wiring. If normal, replace sensor.</td></tr>
<tr><td>Engine controller PCB</td><td>YES</td><td>Replace engine controller PCB.</td></tr>
<tr><td>Image controller PCB</td><td>3</td><td>Is problem solved by replacing image controller PCB?</td><td>YES</td><td>END</td></tr>
</table>

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9. Ink not supplied

Cause/Error Section	Step	Check Item	Result	Treatment
No ink	1	Is there ink in the ink bottle?	NO	Replace the ink bottle.
Ink bottle installation error	2	Is the ink bottle properly installed?	NO	Set the ink bottle correctly.
Tube cock open error	3	Is the tube cock opened properly?	NO	Release the tube cock.
Head joint	4	Is the problem solved by replacing the head joint?	YES	END
Tube installation error	5	Is the tube from the head joint to the ink bottle connected correctly?	NO	Connect the tube correctly.
Tube	6	Is the problem solved by replacing the tube?	YES	END

10. Tank Empty Message Continued

Cause/Error Section	Step	Check Item	Result	Treatment
No ink	1	Is there ink in the ink bottle?	NO	Replace the ink bottle.
Ink bottle installation error	2	Is the ink bottle properly installed?	NO	Set the ink bottle correctly.
Connector disconnected	3	Is the ink detection harness connected to the buffer cap?	NO	Connect the connectors properly.
Ink detection harness	4	Is the solved problem by replacing ink detection harness?	YES	END
Buffer cap	5	Is the solved problem by replacing buffer cap?	YES	END
Ink detection PCB	6	Is the solved problem by replacing ink detection PCB?	YES	END
Engine controller PCB	7	Is the solved problem by replacing engine controller PCB?	YES	END
Image controller PCB			NO	Replace the image controller PCB.

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V. LAYOUT AND FUNCTION OF ELECTRICAL PARTS

A. Sensors

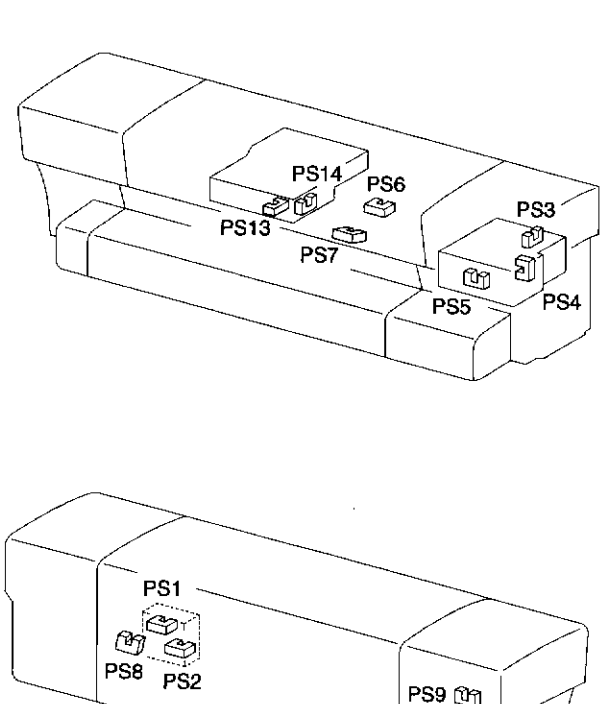

Figure 5-501

Name	Symbol	Function
Photo-interrupter	PS1	Detection of cut sheet
	PS2	Detection of roll media
	PS3	Detection of carriage home position
	PS4	Detection of pressure cam home position
	PS5	Detection of cap cam home position
	PS6	Detection of media at exit
	PS7	Detection of trailing edge of cut sheet
	PS8	Detection of media transportation/X-axis motor rotation
	PS9	Detection of feeder unit open/close
	PS13	Detection of cutter position
	PS14	Detection of cartridge fixing knob setting

Table 5-501

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B. Switches, Motors and Solenoids

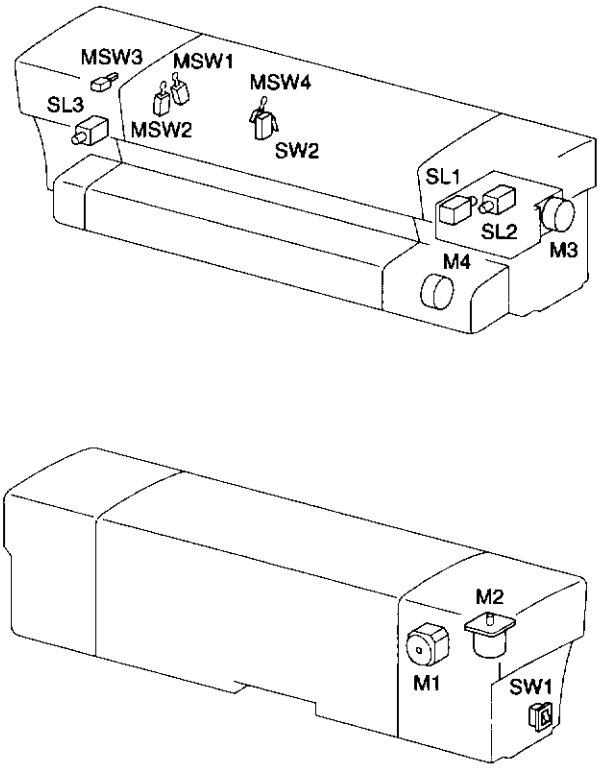

Figure 5-502

Name	Symbol	Function
Switch	SW1	Power switch
	SW2	Detection of dust cover
Microswitch	MSW1	Detection of cut sheet position
	MSW2	Detection of roll media position
	MSW3	Detection of media retainer
	MSW4	Detection of dust cover open/close
Motor	M1	Media feed motor
	M2	Carriage drive motor
	M3	Purge unit drive motor
	M4	Path change motor
Solenoid		
	SL1	Wiper blade 1 raise solenoid
	SL2	Wiper blade 2 raise solenoid
	SL3	Media retainer raise solenoid

Table 5-502

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C. Printed Circuit Boards, Others

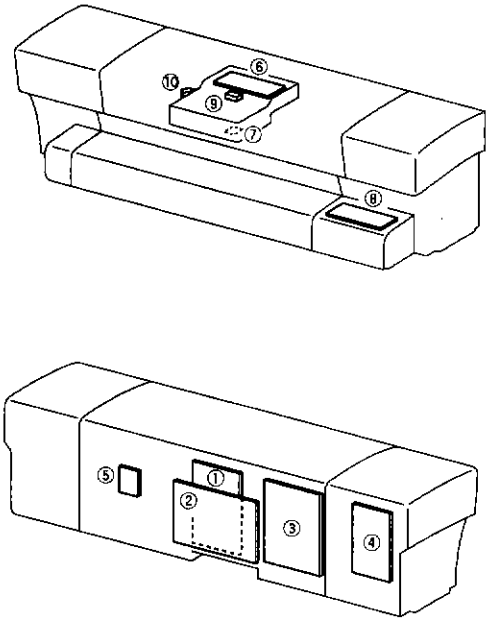

Figure 5-503

Name	Symbol	Function
Engine controller PCB	①	Sequence control/motor control/processing of image data
Image controller PCB	②	Data communications with computer/processing of image data
DC power supply PCB	③	DC power supply
Motor controller PCB	④	X-axis/Y-axis motor drive
Ink detection PCB	⑤	Relaying of motor drive signals
Carriage PCB	⑥	Relaying bubble jet head drive signal/transfering head status to Engine controller
Volume PCB	⑦	Detection of carriage height/room temperature
Operation PCB	⑧	Control panel keys, LEDs, display control
MR sensor	⑨	Generation of encoder pulses
Media sensor	⑩	Detection of media width, skewing during media feed/auto head adjustment

Table 5-503

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D. Variable Resistors (VR),LEDs and Check Pins by PCB

The following describes the variable resistors (VR),LEDs and check pins provided on this printer that need on-site servicing.

CAUTION

VRs that may be adjusted in the field
VRs that must not be adjusted in the field

1. Engine Controller PCB

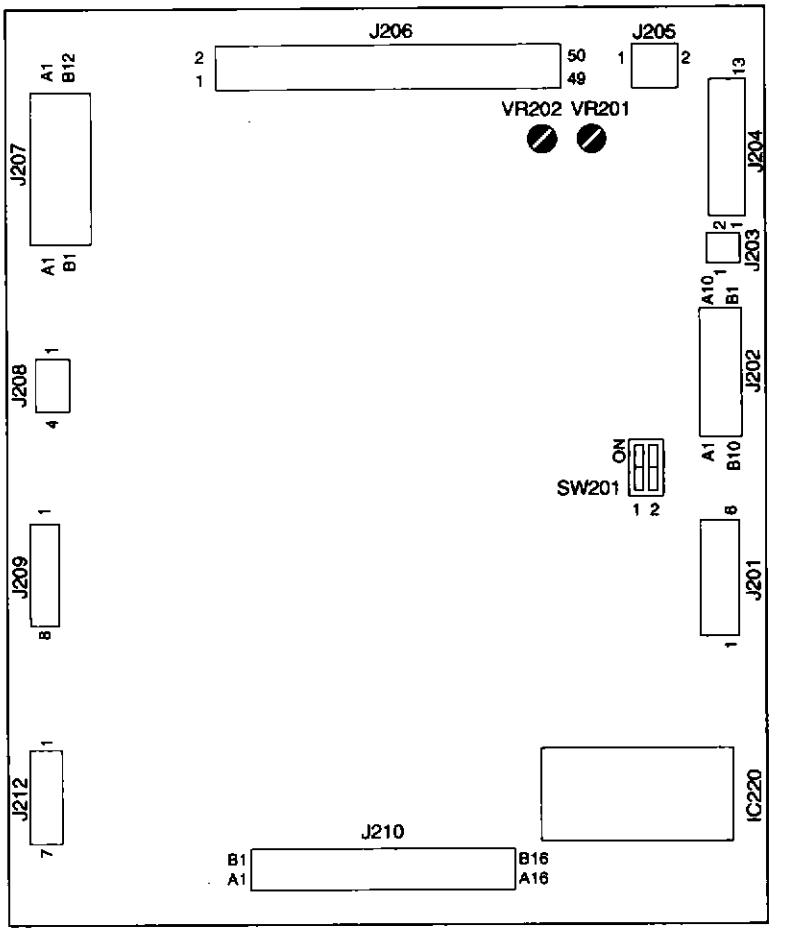

Figure 5-504

No.	Function	Remarks
SW201-1	For factory setting	Default:OFF
SW201-2	For factory setting	Default:OFF
VR201	Media sensor lamp intensity adjustment	
VR202	Media sensor lamp intensity adjustment	

Table 5-504

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2. Image Controller PCB

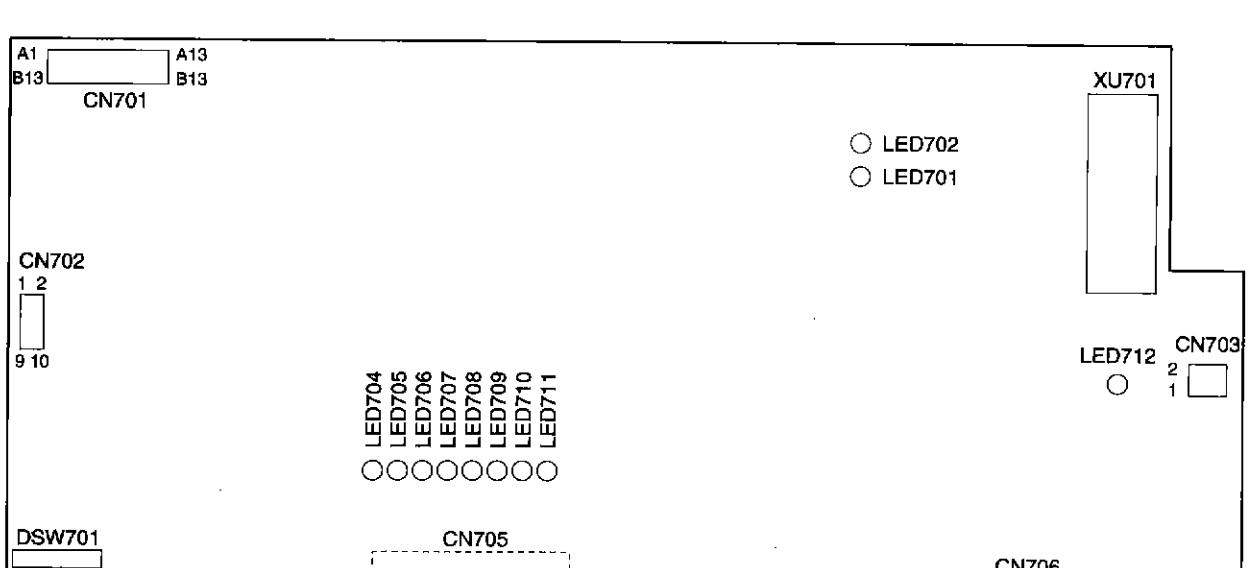

Figure 5-505

No.	Function	Remarks
DSW701-1	For factory setting	ON
DSW701-2	For factory setting	OFF
DSW701-3	For factory setting	OFF
DSW701-4	For factory setting	OFF
DSW701-5	For factory setting	OFF
DSW701-6	For factory setting	OFF
DSW701-7	For factory setting	OFF
DSW701-8	For factory setting	ON
CN-702	For factory setting	—
LED701	Lights when CPU stops	—
LED702	Lights during CPU operation	—
LED704 ~ LED711	For factory adjustment	—
LED712	Lights during power ON	—

Table 5-505

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3. Carriage PCB

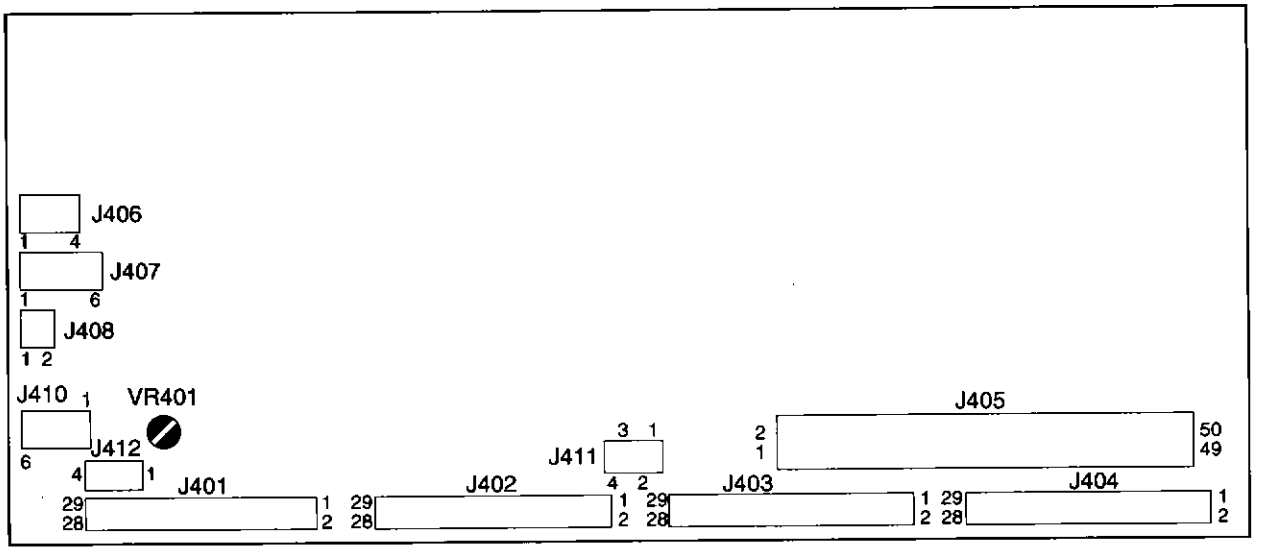

Figure 5-506

No.	Function	Remarks
VR401	Media sensor sensitivity adjustment	—
J412-1	Media sensor lamp intensity adjustment	Voltage 2.0 ±0.05 V
J412-2	Media sensor sensitivity adjustment	Voltage 12.0 ±0.1 V
J412-3	Media sensor lamp intensity adjustment	Voltage 16.5 ±0.1 V
J412-4	GND	

Table 5-506

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E. Short Flexible Cable Terminal Assignments

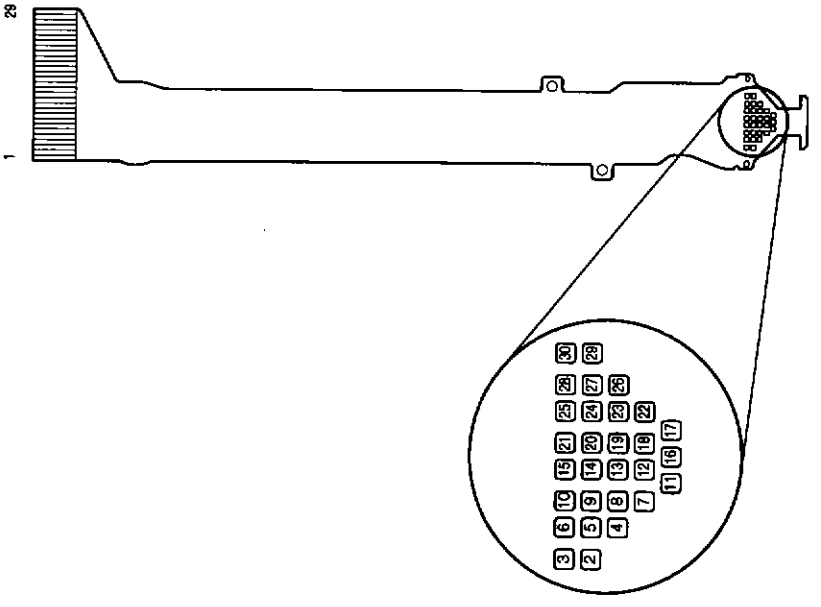

Figure 5-507

Connector No. on Head Relay PCB	Signal Name	Terminal No.	Connector No. on Head Relay PCB	Signal Name	Terminal No.
1	HGND	2	16	HEATC	21
2	HGND	3	17	ODD	20
3	MC2	11	18	HEATD	19
4	VH	4	19	HEATB	18
5	VH	5	20	EVEN	22
6	DIA	6	21	BENB0	23
7	RNK	10	22	BENB1	24
8	NC	9	23	BENB2	25
9	SUB	8	24	H5V	28
10	MC1	7	25	HRESET	27
11	NC	12	26	LTCLK	26
12	NC	13	27	DCLK	17
13	NC	14	28	DIK	30
14	GNDL	15	29	IDATA	29
15	HEATA	16			

Table 5-507

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VI. SERVICE MODE

A. Outline

This printer has 11 types service mode that can allow adjustment this printer in the field and factory.

B. Using the Service Mode

1. How to Enter the Service Mode

1) Turn the power switch ON with the Up and Down arrow keys held down.
2) Make sure that "Initializing" is displayed on the message display before releasing your fingers from these keys.
   - The printer enters the service mode, and then "Factory Mode" is displayed on the message display. The "Mdia Guide Adjst" service mode menu is then displayed.

2. How to Exit the Service Mode

Turn the power switch OFF.

3. Service Mode Menu Items

Table 1-306 shows the service mode menus provided on this printer.

Menu Name	Description	Remarks
Mdia Guide Adjst	Adjustment of media retainer hook position	page 5-6
Sensor Gain	Adjustment of media sensor gain	page 5-7
Sensor Light Adj	Adjustment of media sensor light intensity	page 5-8
Media Size Adjst	Compensation of media length	page 5-10
Margin Adjust	Compensation of margin	page 5-10
Input Room Temp.	Compensation of room temperature thermistor	page 5-11
Head Rank Adjust	Compensation of head temperature sensor	page 5-11
Clear Waste Tank	Clear waste ink counter	page 5-13
Service St. Check	Purge unit check mode (for factory setting)	
Wiper Height Adj	Wiper blade height adjustment mode (for factory setting)	
Heat Run Test	Heat run mode (for factory setting)	

Table 5-601

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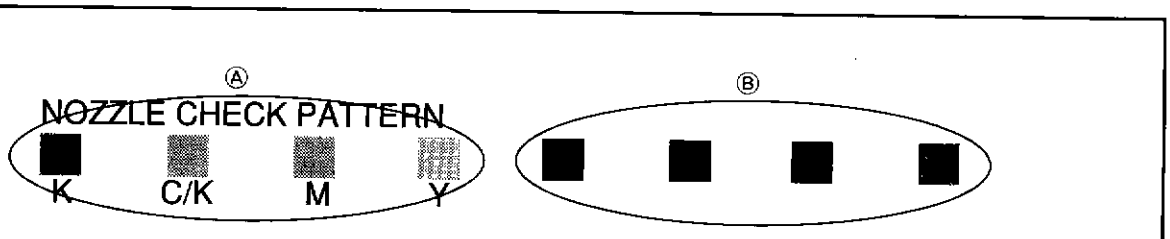
C. Details of Output Setup List

The setups adjusted in the service mode can be checked by outputting the Setup List in the user mode. Figure 5-601 shows a sample Setup List printout. Table 5-602 describes this list in detail.



--- SETUP LIST ---

Ⓒ VERSION	E:11.02 I:03.08		
Ⓓ AUTO CUT	YES	Ⓘ EOP TIMER	30 SEC.
Ⓔ PRINT MODE	ENHANCED	Ⓙ DRYING TIME	10MIN.
Ⓕ PRINT FREQUENCY	10kHz	Ⓚ BAND ADJUSTMENT	0
Ⓖ MEDIA TYPE	COATED PAPER	Ⓛ BUSY-ACK	A-B
Ⓗ BANDING REDUCTION	NO	Ⓜ LANGUAGE	ENGLISH

Following numbers are for customer supports.
1:1.34 2:-3.0 3:0.0 4:0.0 5:0.0 6:-0.3
7:144 8:144 9:144 10:145 11:2464 12:90
E1:0x00 E2:0x42 E3:0xC1

Figure 5-601

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No.	Name	Unit	Reference Value	Remarks
1	Room temperature thermistor offset value	°C	0	
2	Media length offset value	mm	0	
3	Leading edge margin offset value	mm	0	
4	Left margin offset value	mm	0	
5	Trailing edge margin offset value	mm	0	
6	Media retainer hook position adjustment value	mm	0	
7	Head temperature sensor offset value (Bk)		151 ± 15	The difference between the Bk, C, M and Y minimum and maximum values must be within 6.
8	Head temperature sensor offset value (C)			
9	Head temperature sensor offset value (M)			
10	Head temperature sensor offset value (Y)			
11	Waste ink counter value			Waste ink tank becomes full at 440,000.
12	Total printing time	houre		
E1	Error display history (latest indication)			An error code described on page 5-44 onwards is printed following 0x. **Note:** Errors that are not caused by the printer such as media jam errors do not remain in the error history.
E2	Error display history (previous indication)			
E3	Error display history (previous-previous indication)			

Table 5-602

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VII. ERROR CODES

A. Error Code List

This printer has a self-diagnostic function for detecting the printer status on the engine controller PCB. Self-diagnostic are performed at all times. When the self-diagnostic function judges that an error has occurred, it displays an error code on the message display on the control panel that indicates the details of the trouble.

The following tables shows the error codes that are displayed, when these errors are detected, and the main cause of the error.

Error code	Detection Timing	Main Cause
00	• When the dust cover is opened during printing • When the dust cover is opened during carriage movement • When the dust cover is opened during media feeding	
0B	When an error is detected during media retainer hook position adjustment, media sensor gain adjustment, media sensor light intensity adjustment or head temperature sensor compensation adjustment.	
41	• When the cut sheet detection sensor (PS1) does not turn OFF even though the roll media has been fed by the fixed amount during path change • When the feeder open/close sensor (PS9) turns ON before the leading edge of the roll media passes cut sheet media sensor (PS1) during path change	Defective cut sheet detection sensor (PS1)
42	When the torque limitter for the Y cutter is tripped during cutting of media, and the Y cutter has risen	
43	• When the media discharge sensor (PS6) does not turn ON (at 2nd leading edge detection) even though the media has been fed by the fixed amount after media feed has started • When the feeder open/close sensor (PS9) turns ON (at 2nd leading edge detection) before the leading edge of the media arrives at PS6 after media feed has started	Defective media discharge sensor (PS6)
45	• When the media discharge sensor (PS6) does not turn ON (at 1st leading edge detection) even though the media has been fed by the fixed amount after media feed has started • When the feeder open/close sensor (PS9) turns ON (at 1st leading edge detection) before the leading edge of the media arrives at PS6 after media feed has started	• Defective media discharge sensor (PS6) • Defective feeder open/close sensor (PS9)
47	When the detected media is shorter than 186 mm during media length detection when cut sheet media is being fed	
48	• When the detected media is longer than 1300 mm during media length detection when cut sheet media is being fed • When the feeder open/close sensor (PS9) turns ON during media length detection when cut sheet media is being fed	

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Error code	Detection Timing	Main Cause
4E	• When cut sheet detection sensor (PS1) does not turn ON even though the media has been fed by the fixed amount after feeding of roll media has started • When the media has been drawn out and removed after feeding of cut sheet media has started • When the feeder open/close sensor (PS9) turns ON before the leading edge of the media reaches the platen after media feed has started	Defective cut sheet detection sensor (PS1)
50	• When cut sheet detection sensor (PS1) does not turn OFF even though the media has been fed by the fixed amount when the cut sheet media is fed backwards in the printer so that it can be removed • When feeder open/close sensor (PS9) turns ON before the leading edge of the cut sheet media has passed beyond cut sheet detection sensor (PS1) when the cut sheet media is fed backwards in the printer so that it can be removed	Defective cut sheet detection sensor (PS1)
51	When the feeder open/close sensor turns ON after the trailing edge of the cut sheet media has passed beyond the cut sheet detection sensor (PS1) when the cut sheet media is fed forwards in the printer so that it can be removed	
52	• When media discharge sensor (PS6) does not turn ON by the leading edge of the media even though the media has been fed by the fixed amount when the media is fed backwards to the platen • When feeder open/close sensor (PS9) turns ON before the leading edge of the media has passed beyond media discharge sensor (PS6) when the media is fed backwards to the platen	Defective media discharge sensor (PS6)
53	When roll media detection sensor (PS2) detects the trailing edge of roll media	
54	• When media retainer detection switch (MSW3) does not turn OFF when the media retainer is drawn out • When media retainer detection switch (MSW3) does not turn ON when the media retainer is returned	• Defective media retainer detection switch (MSW3) • Defective media retainer hook position adjustment
55	• When cut sheet detection sensor (PS1) does not turn OFF by the trailing edge of the media even though the media has been fed by the fixed amount when the cut sheet media is fed forwards in the printer so that it can be removed • When feeder open/close sensor (PS9) turns ON before the trailing edge of the cut sheet media passes beyond cut sheet detection sensor (PS1) when the cut sheet media is fed forwards in the printer so that it can be removed	Defective cut sheet detection sensor (PS1)

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Error code	Detection Timing	Main Cause
56	• When media discharge sensor (PS6) does not turn OFF even though the media has been fed by the fixed amount after media feed has started • When feeder open/close sensor has turned ON before the leading edge of the media passes media discharge sensor (PS6) after media feed has started	Defective media discharge sensor (PS6)
57	When feeder open/close sensor (PS9) turns ON during cut sheet media skew detection	
58	When feeder open/close sensor (PS9) turns ON during roll media skew detection	
59	When the media sensor cannot detect the right edge of the media at the 2nd skew detection	
5D	When feeder open/open sensor (PS9) turns on during media feed when the auto head adjustment is being carried out in the vertical head adjustment	
5E	• When the width of the media detected by media width detection is larger than 929.4 mm • When the width of the media detected by media width detection is smaller than 195.0 mm	
5F	• When the media sensor cannot detect the edges of the media during media width detection • When the right edge of the media cannot be detected within 7 mm of the media guide during media width detection • When the left edge of the media cannot be detected within 929.5 mm of where the right edge of the media is detected during media width detection	• Defective or dirty media sensor • Defective media sensor light intensity adjustment
60	When the right edge of the media cannot be detected within 7 mm of the media guide by skew detection after roll media is printed	• Defective or dirty media sensor • Defective media sensor light intensity adjustment
61	When feeder open/close sensor (PS9) turns ON during media feed	
80	When an error is detected in the head temperature sensor on the bubble jet cartridge	• Defective bubble jet cartridge • Defective bubble jet cartridge contact • Defective short flexible cable • Defective carriage PCB
81	When an error is detected in the head temperature sensor on the bubble jet cartridge	• Defective bubble jet cartridge • Defective bubble jet cartridge contact • Defective short flexible cable • Defective carriage PCB

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Error code	Detection Timing	Main Cause
82	When an error is detected in the rank resistor of the bubble jet cartridge	• Defective bubble jet cartridge • Defective bubble jet cartridge contact • Defective short flexible cable • Defective carriage PCB
84	When the sub-heater temperature does not rise when the sub-heater in the bubble jet cartridge is being driven	• Defective bubble jet cartridge • Defective bubble jet cartridge contact • Defective short flexible cable • Defective long flexible cable
86	When the heater temperature rises when the heater in the bubble jet cartridge is not being driven	• Defective bubble jet cartridge • Defective carriage PCB • Defective engine controller PCB
88	When abnormal temperature rise is detected on the head during printing or during pre-discharge	• No ink • Defective bubble jet cartridge • Defective carriage PCB • Defective engine controller PCB
89	When three non-discharges are detected continuously during non-discharge detection when auto head adjustment is carried out	• No ink • Defective bubble jet cartridge • Defective or dirty media sensor • Defective media sensor gain adjustment • Defective media sensor light intensity adjustment
C0	• When output from the linear encoder is not detected during Y-axis motor (M2) drive • When the carriage home position cannot be detected	• Defective Y-axis motor (M2) • Defective carriage home position sensor (PS3) • Defective linear encoder
C1	When output from media feed detection sensor (PS8) is not detected during X-axis motor (M1) drive	• Defective X-axis motor (M1) • Defective media feed detection sensor (PS8)
C3	When a communications error occurs between the head relay PCB and engine controller PCB	• Defective engine controller PCB • Defective carriage PCB • Defective long flexible cable
C4	When detection signals are not output from pressure cam home position sensor (PS4) or cap cam home position sensor (PS5) during purge motor (M3) drive	• Defective purge motor (M3) • Defective pressure cam home position sensor (PS4) • Defective cap cam home position sensor (PS5)

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Error code	Detection Timing	Main Cause
C5	When an error is detected in the photosensor of the media sensor	Defective media sensor
C6	When the media illumination lamp in the media sensor does not light	• Defective media illumination lamp • Defective media sensor • Defective long flexible cable • Defective carriage PCB • Defective engine controller PCB
C7	When detection signals are not output from cut sheet position switch (MSW1) or roll media position switch (MSW2) during path change motor (M4) drive	• Defective path change motor (M4) • Defective cut sheet position switch (MSW1) • Defective roll media position switch (MSW2)
C8	When a full waste ink tank is detected	
CA	When media retainer detection switch (MSW3) does not turn ON when the media retainer is returned and when the media is not on the platen	• Defective media retainer detection switch (MSW3) • Defective media retainer hook position adjustment • Defective media retainer

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A. SIGNAL NAMES/ABBREVIATION LIST

BENB	BLOCK ENABLE signal
CMCRTD	Y-AXIS MOTOR CURRENT DOWN signal
CMCTRU	Y-AXIS MOTOR CURRENT UP signal
CMSEL0	Y-AXIS MOTOR SELECT 0 signal
CMSEL1	Y-AXIS MOTOR SELECT 1 signal
CMSEL2	Y-AXIS MOTOR SELECT 2 signal
CMSEL3	Y-AXIS MOTOR SELECT 3 signal
CMSELES	Y-AXIS MOTOR SELECT 4 signal
COVSEN	DUST COVER OPEN DETECT signal
CRGHP	CARRIAGE HOME POSITION signal
CTPSET	CUT SHEET SET DETECT signal
CUR0	X-AXIS MOTOR CURRENT 0 signal
CUR1	X-AXIS MOTOR CURRENT 1 signal
CUR2	X-AXIS MOTOR CURRENT 2 signal
CUTPAS	CUT SHEET POSITION DETECT signal
CUTSEN	CUTTER DETECT signal
DCLK	DATA CLOCK signal
DIA	DIODE SENSOR ANODE signal
DIK	DIODE SENSOR CATHODE signal
ENDPSN	PAPER END DETECT signal
EVEN	EVEN signal
FMA	X-AXIS MOTOR PULSE signal A
FMAN	X-AXIS MOTOR PULSE signal AN
FMB	X-AXIS MOTOR PULSE signal B
FMBN	X-AXIS MOTOR PULSE signal BN
FMROL	MEDIA TRANSPORT DETECTION signal
H5VCONT	H5V CONTROL command
HDSEN	CARTRIDGE LOCK DETECT signal
HEATA	HEATER ON command A
HEATB	HEATER ON command B
HEATC	HEATER ON command C
HEATD	HEATER ON command D

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HEATE	HEATER ON command E
HOLDTRG	HOLD TRIGGER command
HRESET	HEAD RESET command
IDATA	IMAGE DATA signal
INK_SEL0	INK SELECT 0 signal
INK_SEL1	INK SELECT 1 signal
INK_SNS	INK SENSOR signal
INK_STA	INK DETECTIONS START command
INK C	INK DETECTION signal C
INK K	INK DETECTION signal K
INK M	INK DETECTION signal M
INK Y	INK DETECTION signal Y
KGHP	MEDIA RETAINER DETECT signal
KGSL	MEDIA RETAINER SOLENOID DRIVE command
LAMP (+)	LAMP ON command
LHA	LINEAR ENCODER PULSE signal A
LHB	LINEAR ENCODER PULSE signal B
LIFTSNS	VOLUME PCB signal
LTCLK	LATCH CLOCK signal
MC1	MENISCUS HEATER ON command 1
MC2	MENISCUS HEATER ON command 2
ODD	ODD signal
OUTPSN	PAPER OUT DETECT signal
PCA	PATH CHANGE MOTOR PULSE command A
PCAN	PATH CHANGE MOTOR PULSE command AN
PCB	PATH CHANGE MOTOR PULSE command B
PCBN	PATH CHANGE MOTOR PULSE command BN
PCCOM	PATH CHANGE MOTOR DRIVE command
PDET	PAPER DETECT signal
PGA	PURGE MOTOR PULSE command A
PGAN	PURGE MOTOR PULSE command AN
PGB	PURGE MOTOR PULSE command B
PGBN	PURGE MOTOR PULSE command BN

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PGCOM	PURGE MOTOR DRIVE command
PRSSEN	PRESSURE LEVER DETECT signal
REGSEN	MEDIA SENSOR OUTPUT signal
RLPSET	ROLL SHEET SET DETECT signal
RNK	RANK signal
ROLPAS	ROLL SHEET POSITION DETECT signal
SUBH	SUB HEATER ON command
THERM	THERMISTOR signal
VACSEL	VACUUM CAM SELECT signal
VCAMHP	VACUUM CAM HOME POSITION signal
WIPSL1	WIPER SOLENOID 1 DRIVE command
WIPSL2	WIPER SOLENOID 2 DRIVE command

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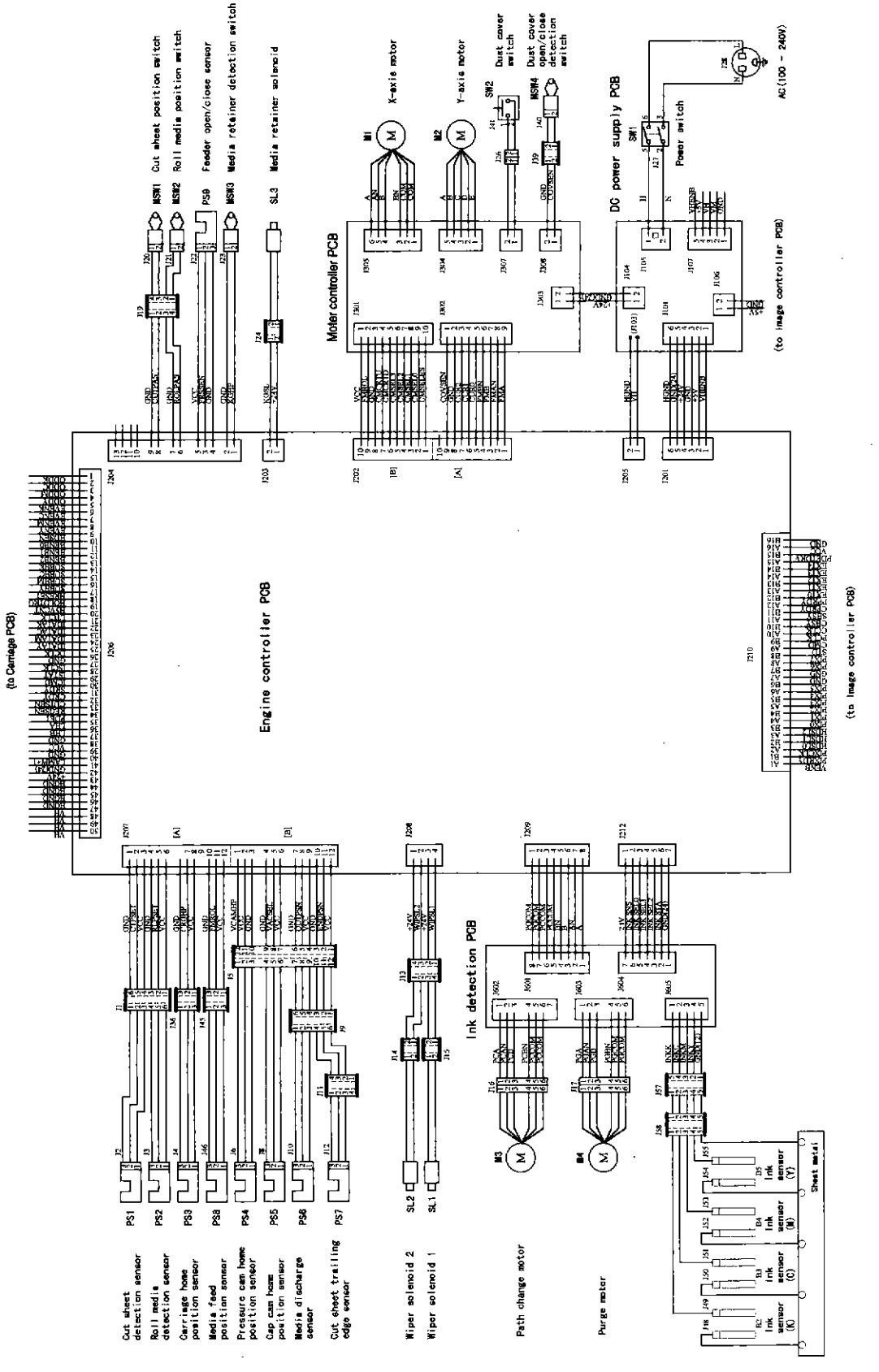
B. GENERAL CIRCUIT DIAGRAM

GENERAL CIRCUIT DIAGRAM (1/3)



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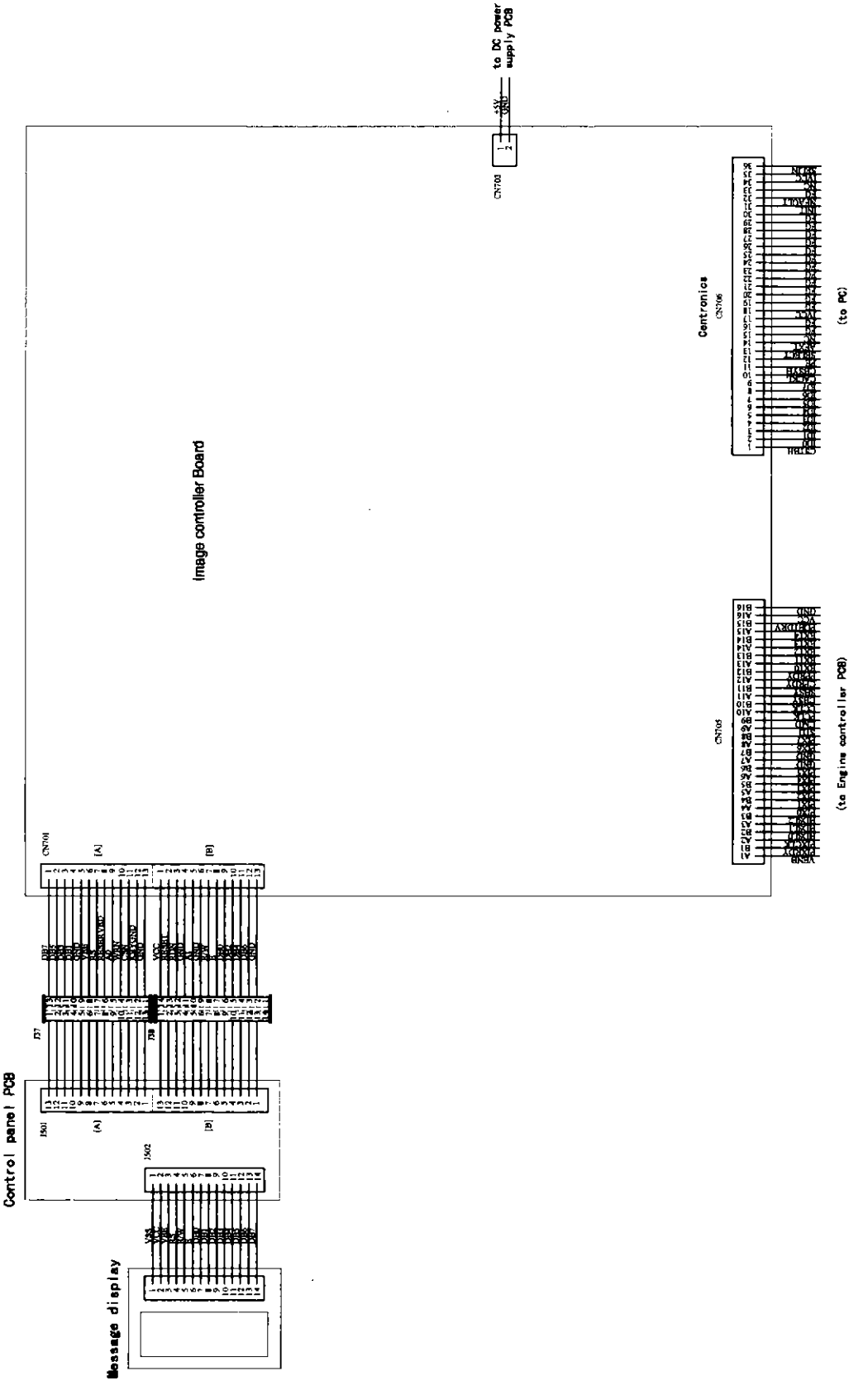
GENERAL CIRCUIT DIAGRAM (2/3)



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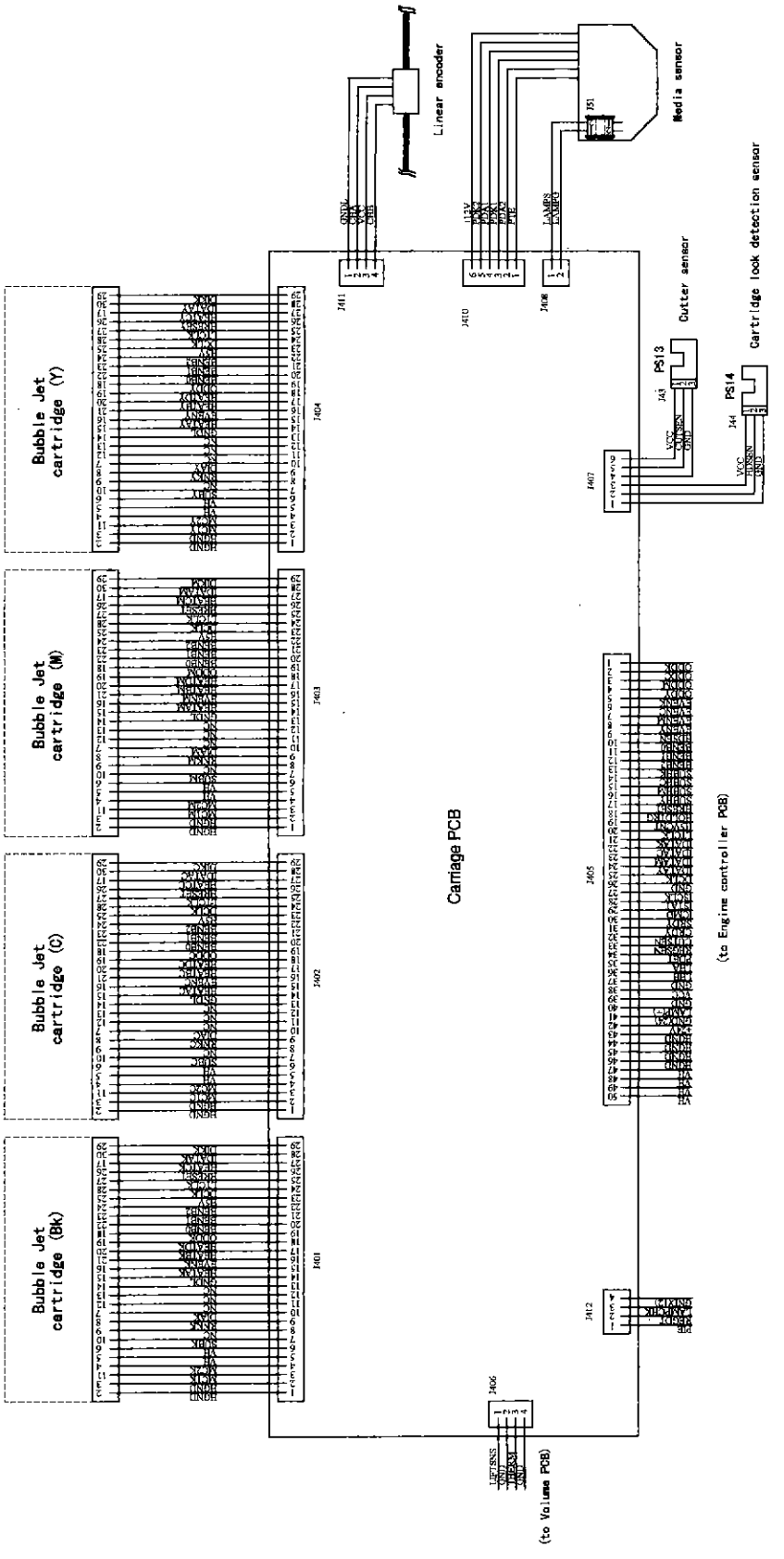
GENERAL CIRCUIT DIAGRAM (3/3)



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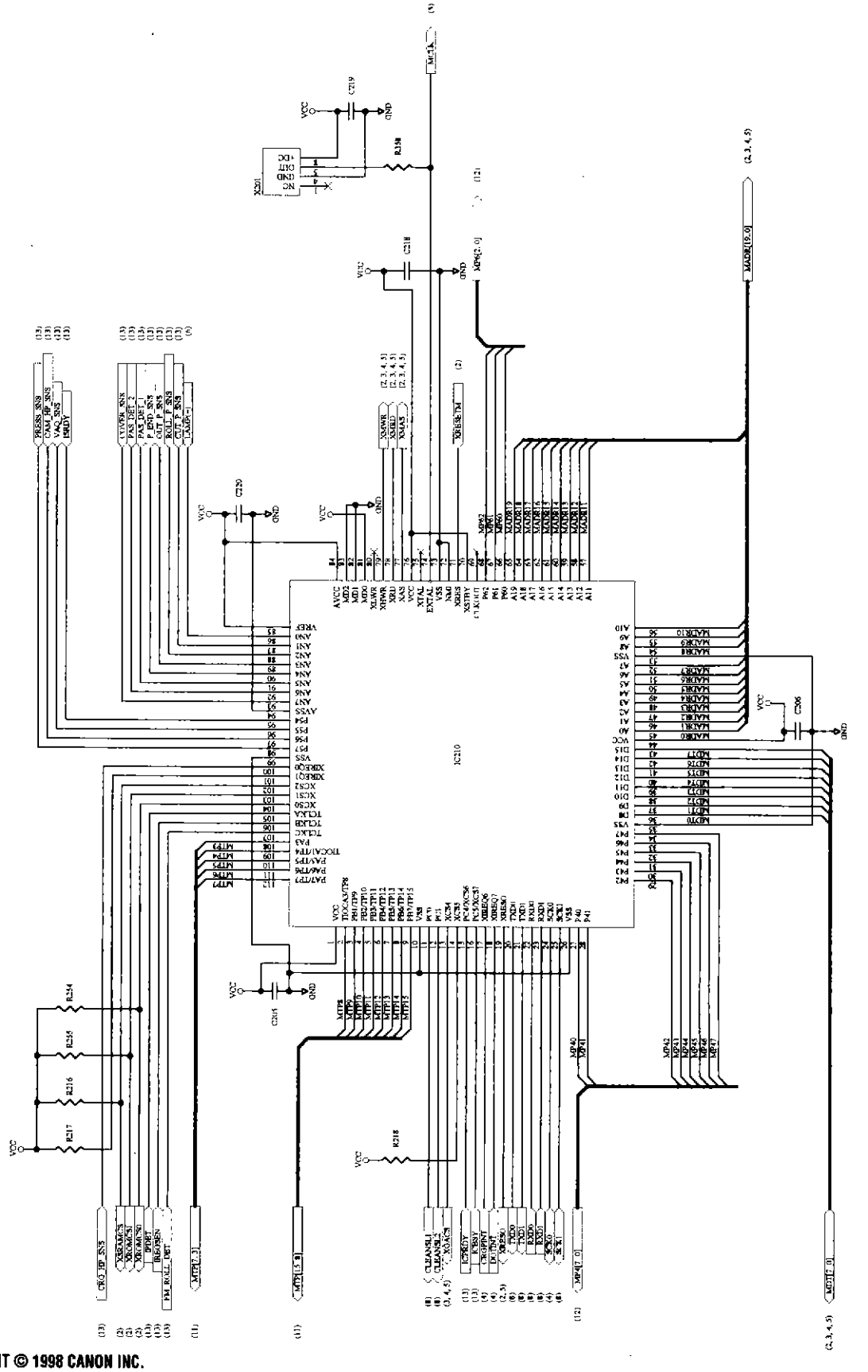
C. ENGINE CONTROLLER BOARD CIRCUIT DIAGRAM

Engine Controller Board Circuit Diagram (1/14)



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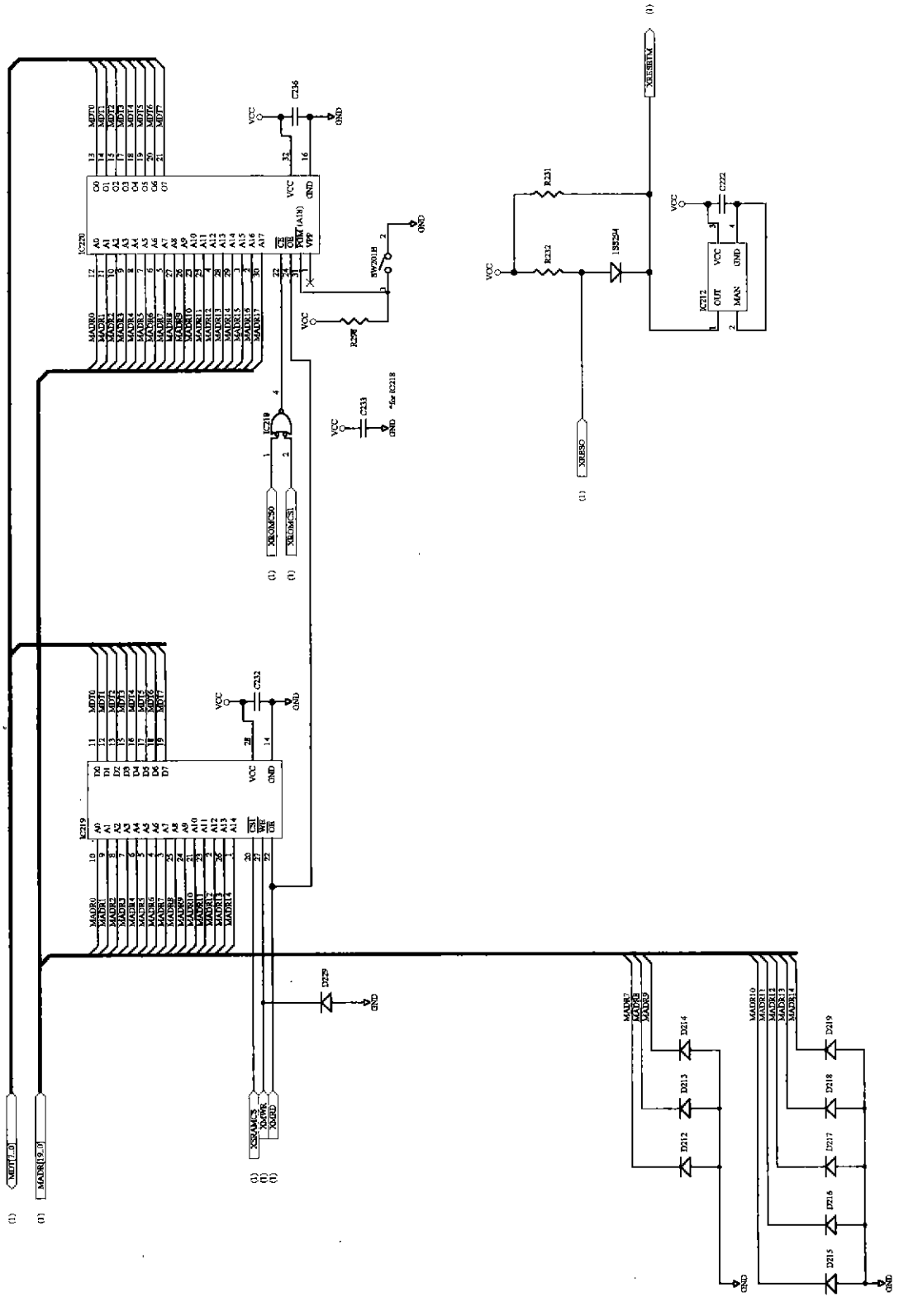
Engine Controller Board Circuit Diagram (2/14)



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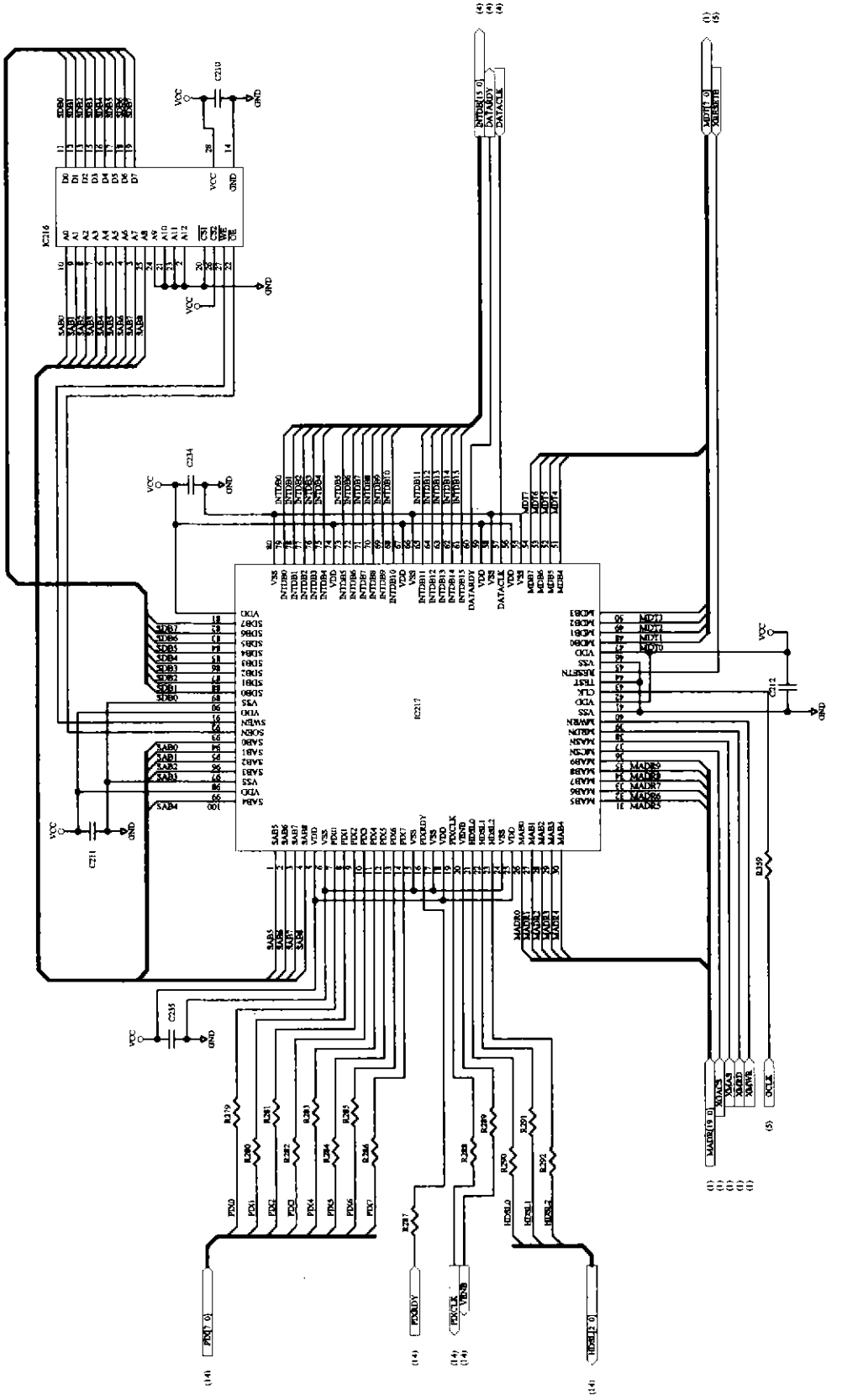
Engine Controller Board Circuit Diagram (3/14)



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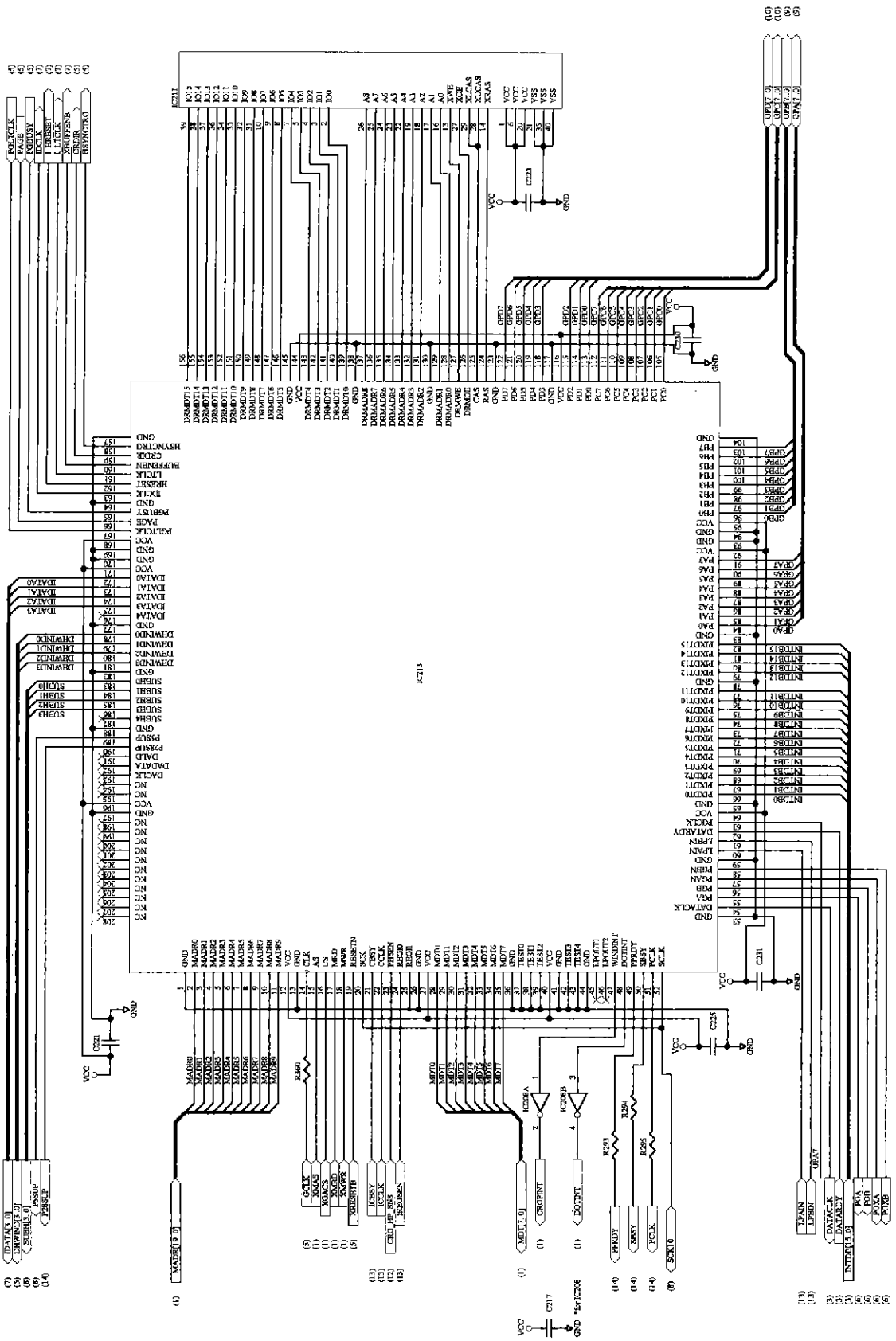
Engine Controller Board Circuit Diagram (4/14)



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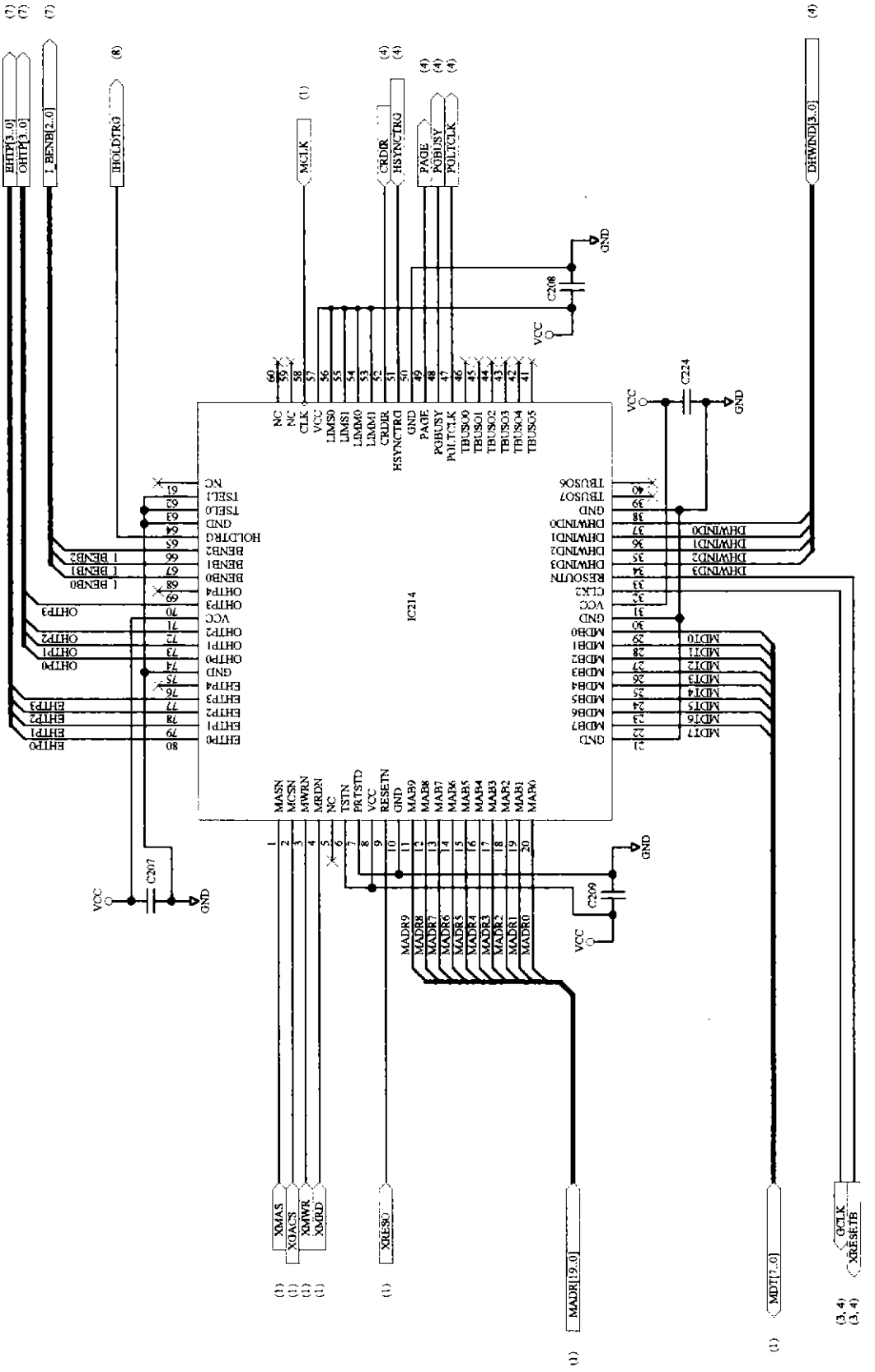
Engine Controller Board Circuit Diagram (5/14)



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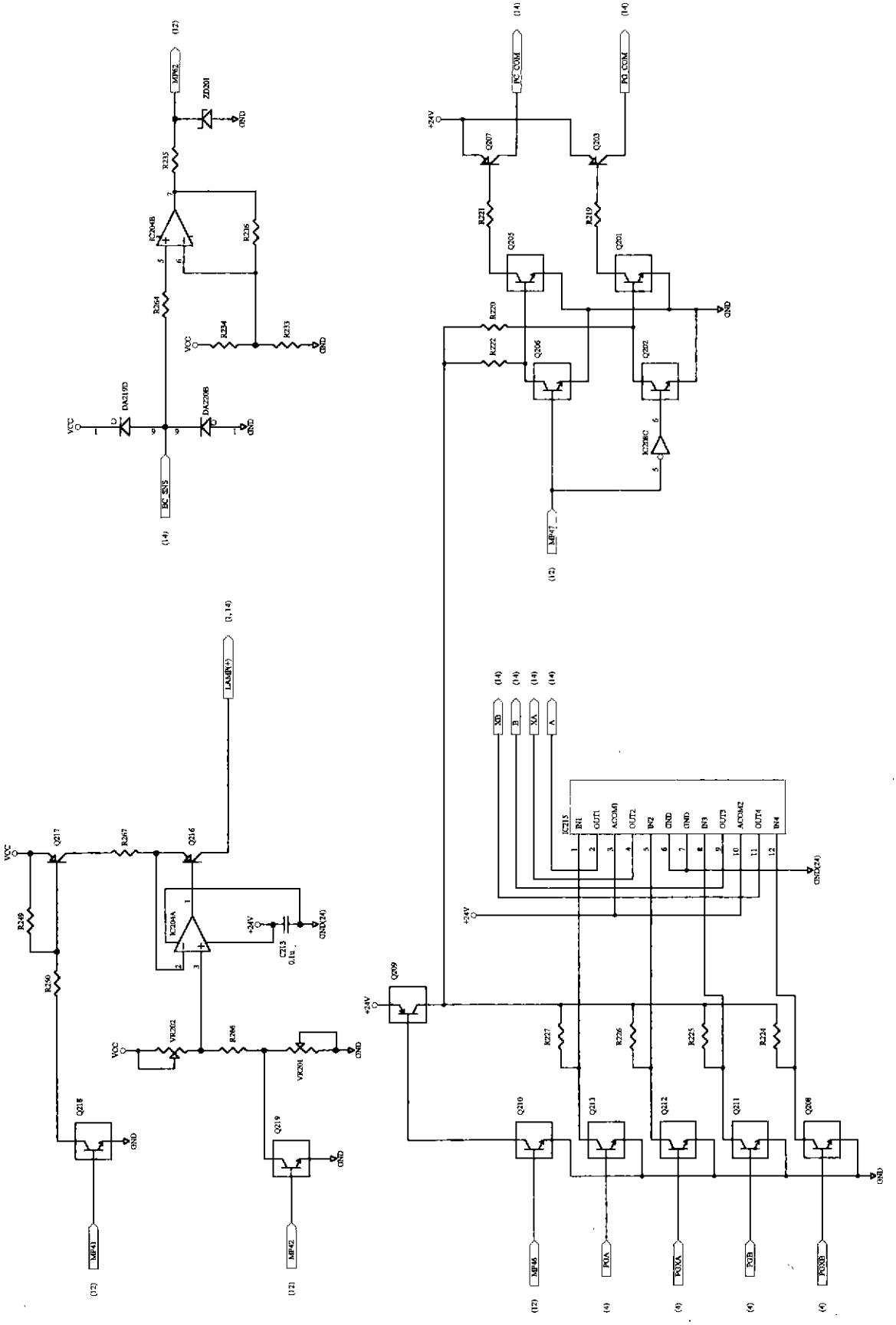
Engine Controller Board Circuit Diagram (6/14)



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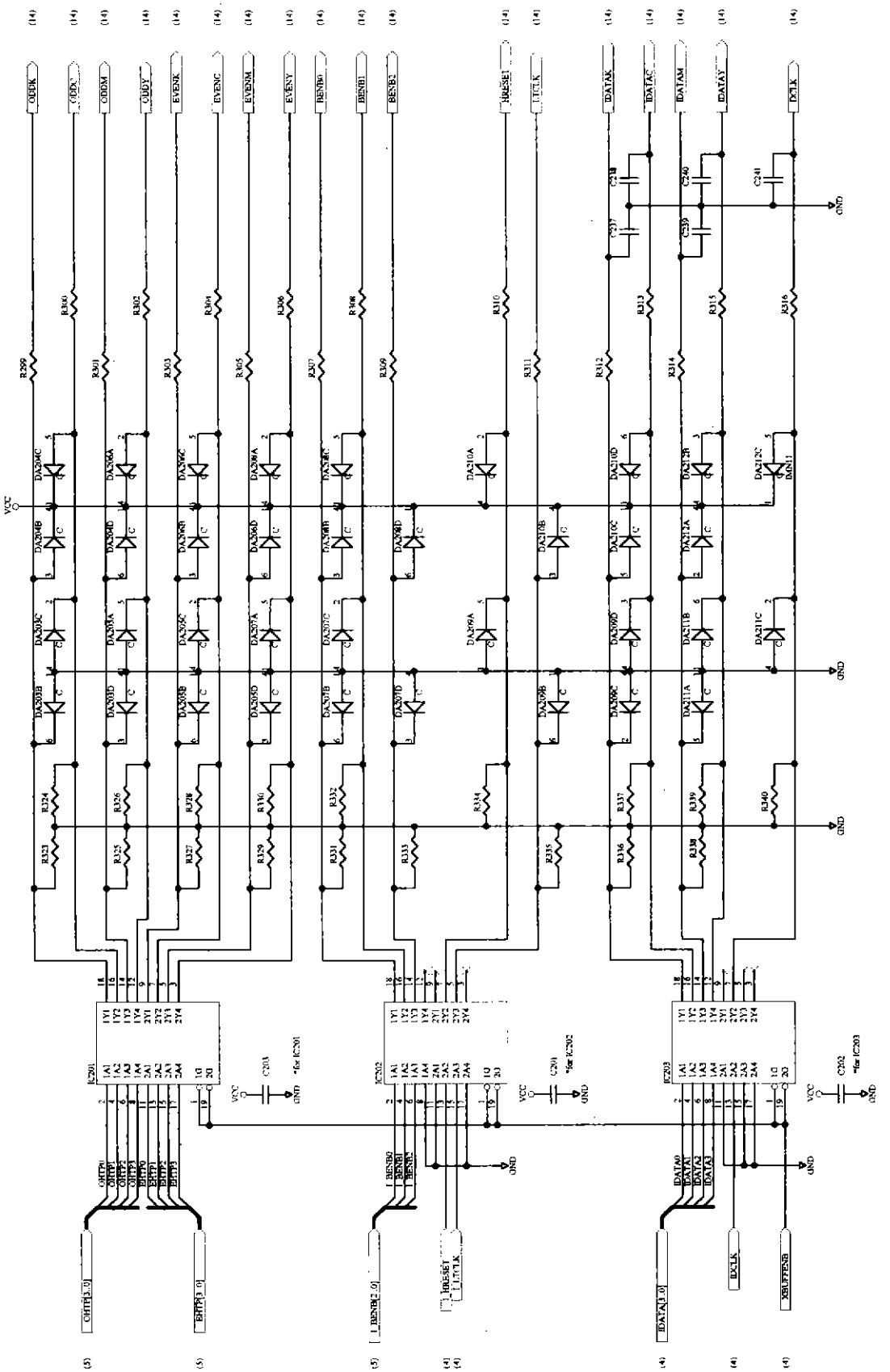
Engine Controller Board Circuit Diagram (7/14)



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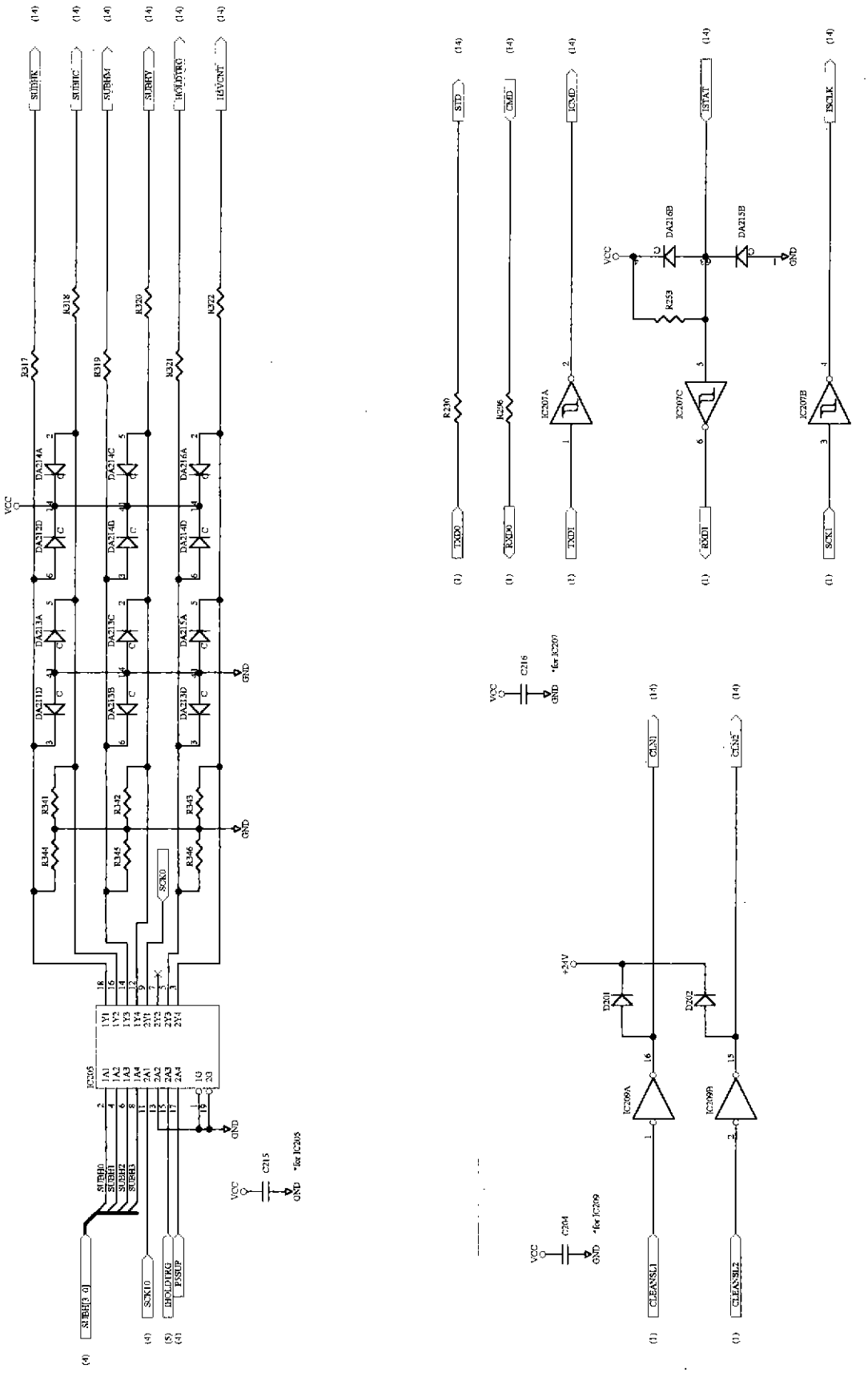
Engine Controller Board Circuit Diagram (8/14)



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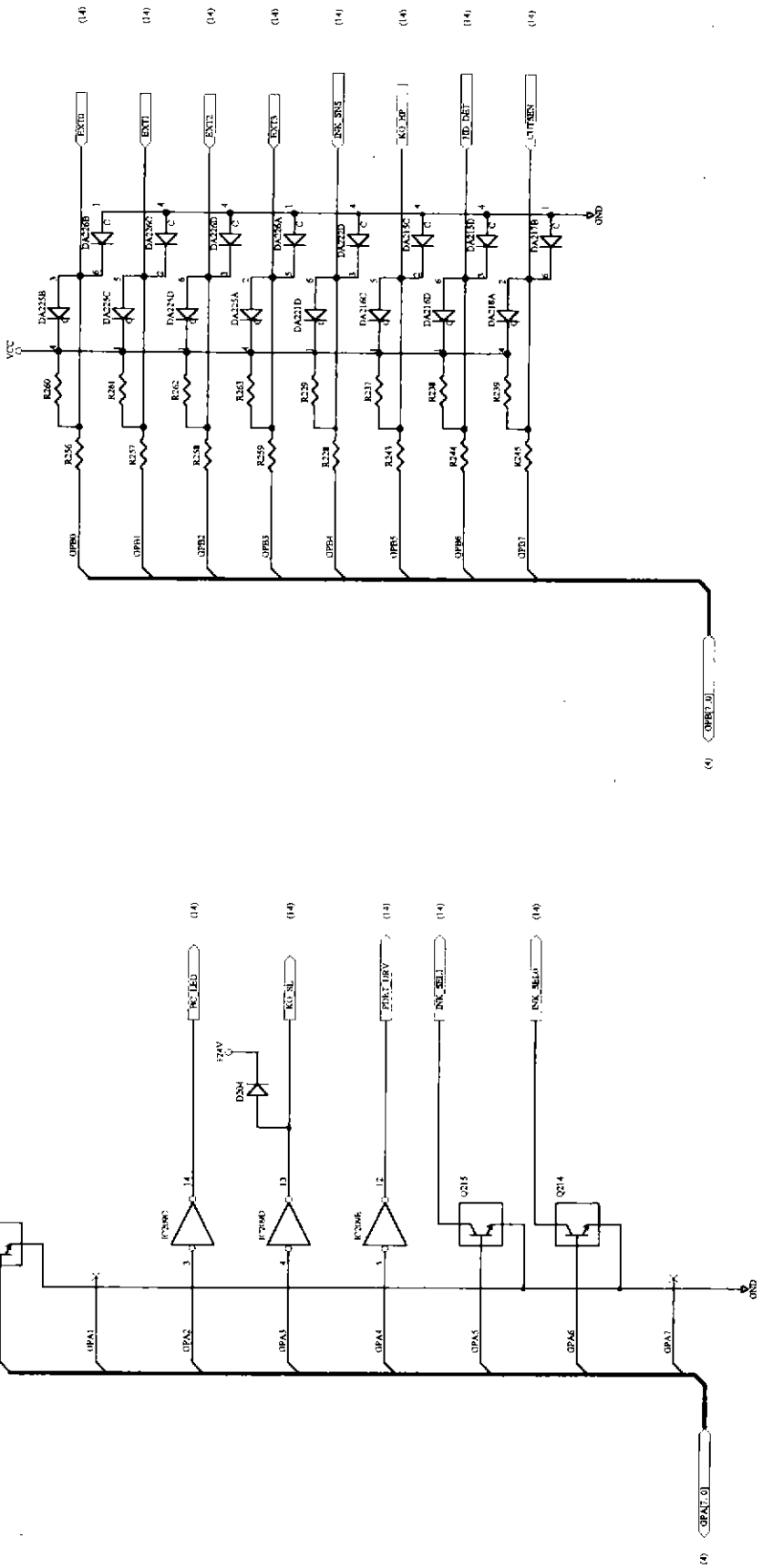
Engine Controller Board Circuit Diagram (9/14)



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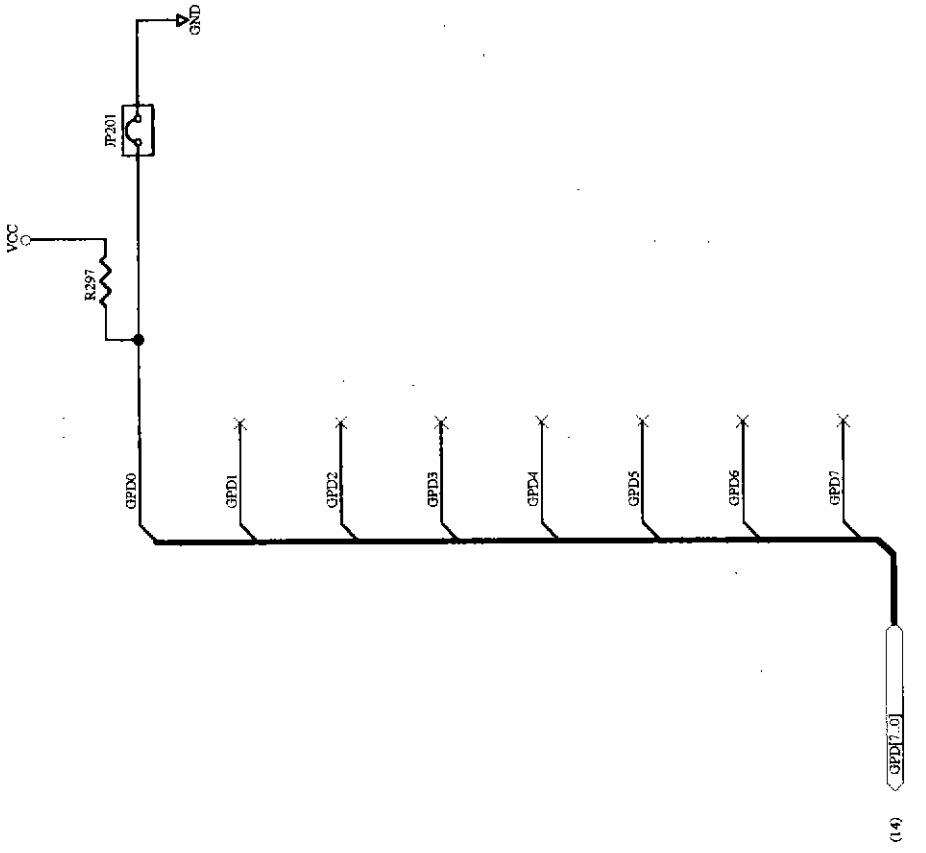
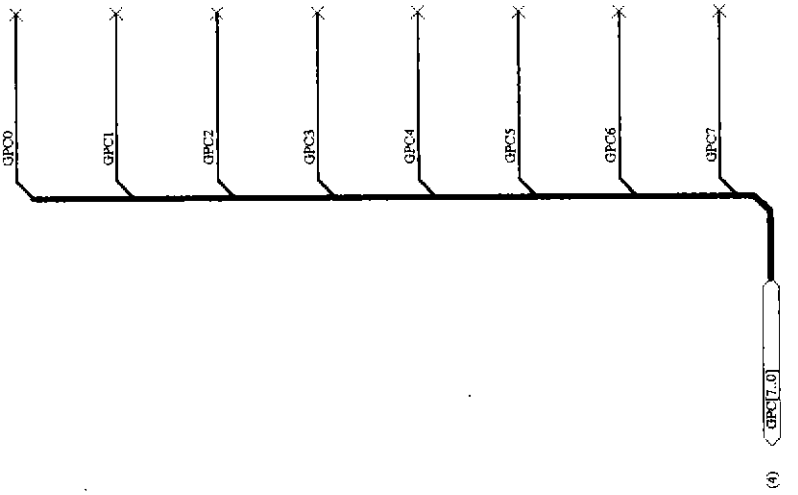
Engine Controller Board Circuit Diagram (10/14)





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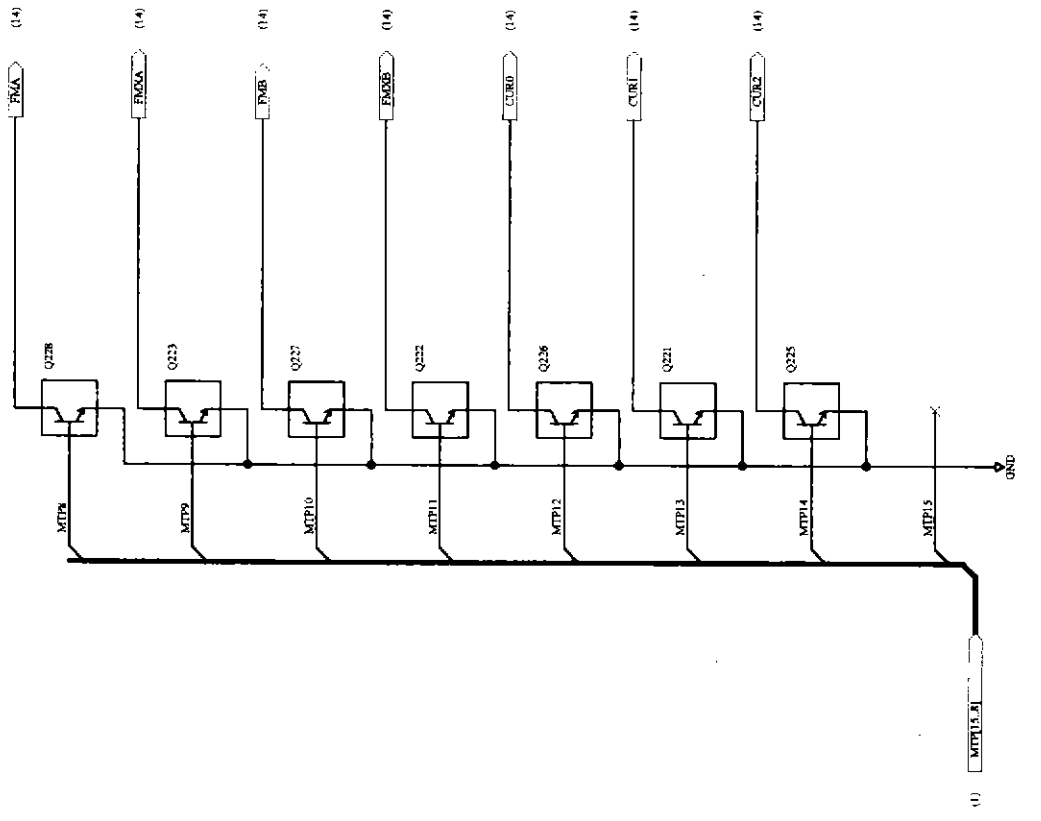
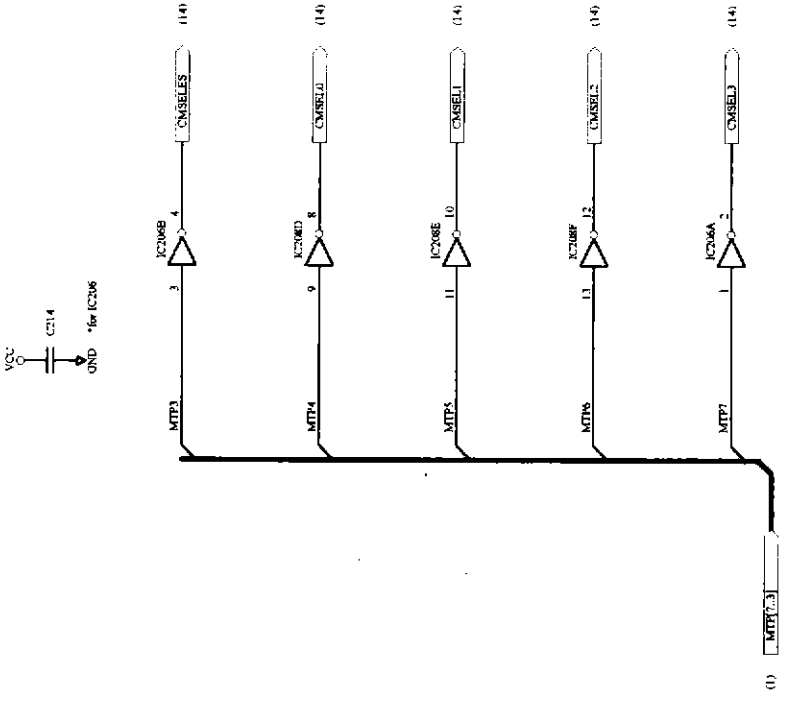
Engine Controller Board Circuit Diagram (11/14)





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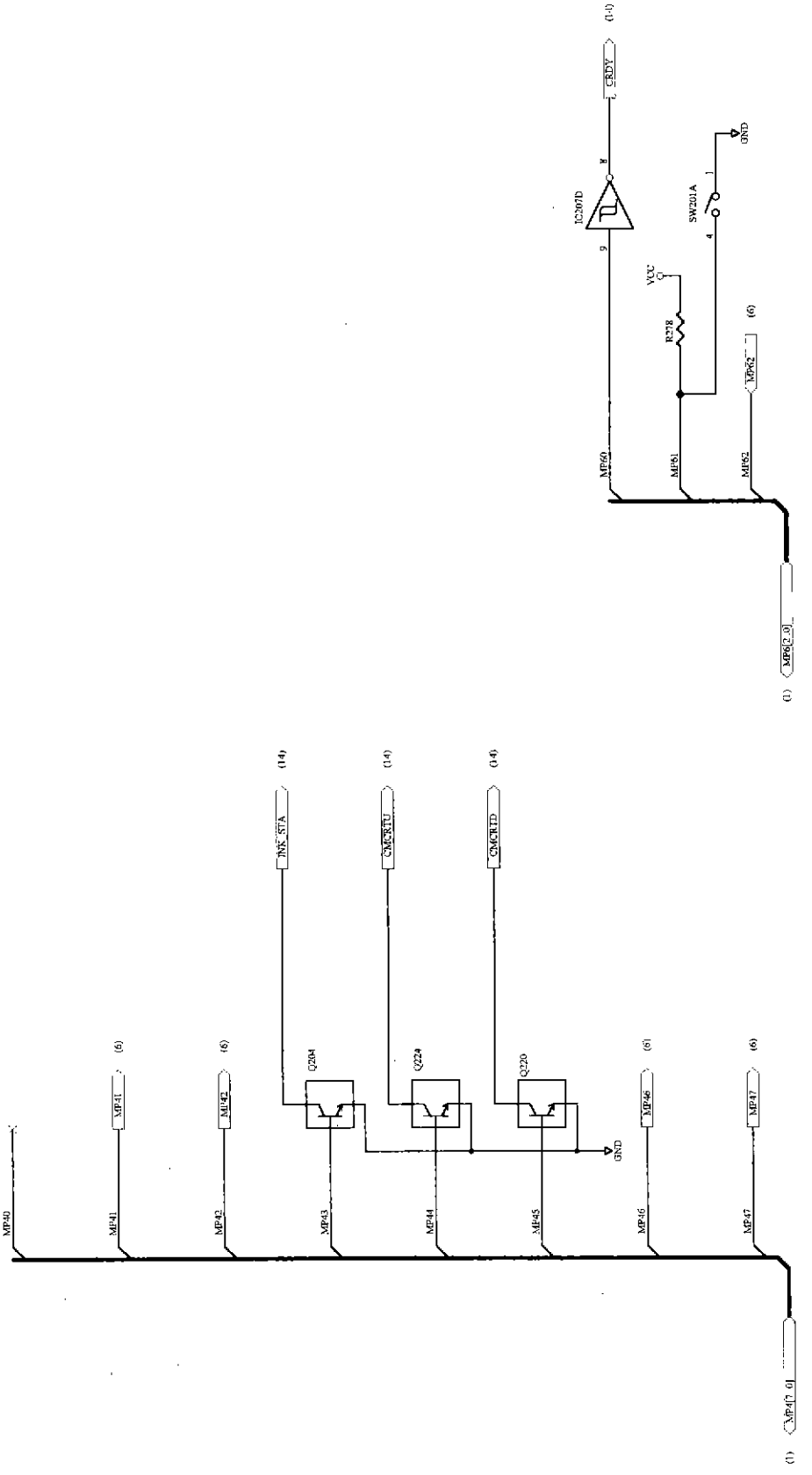
Engine Controller Board Circuit Diagram (12/14)



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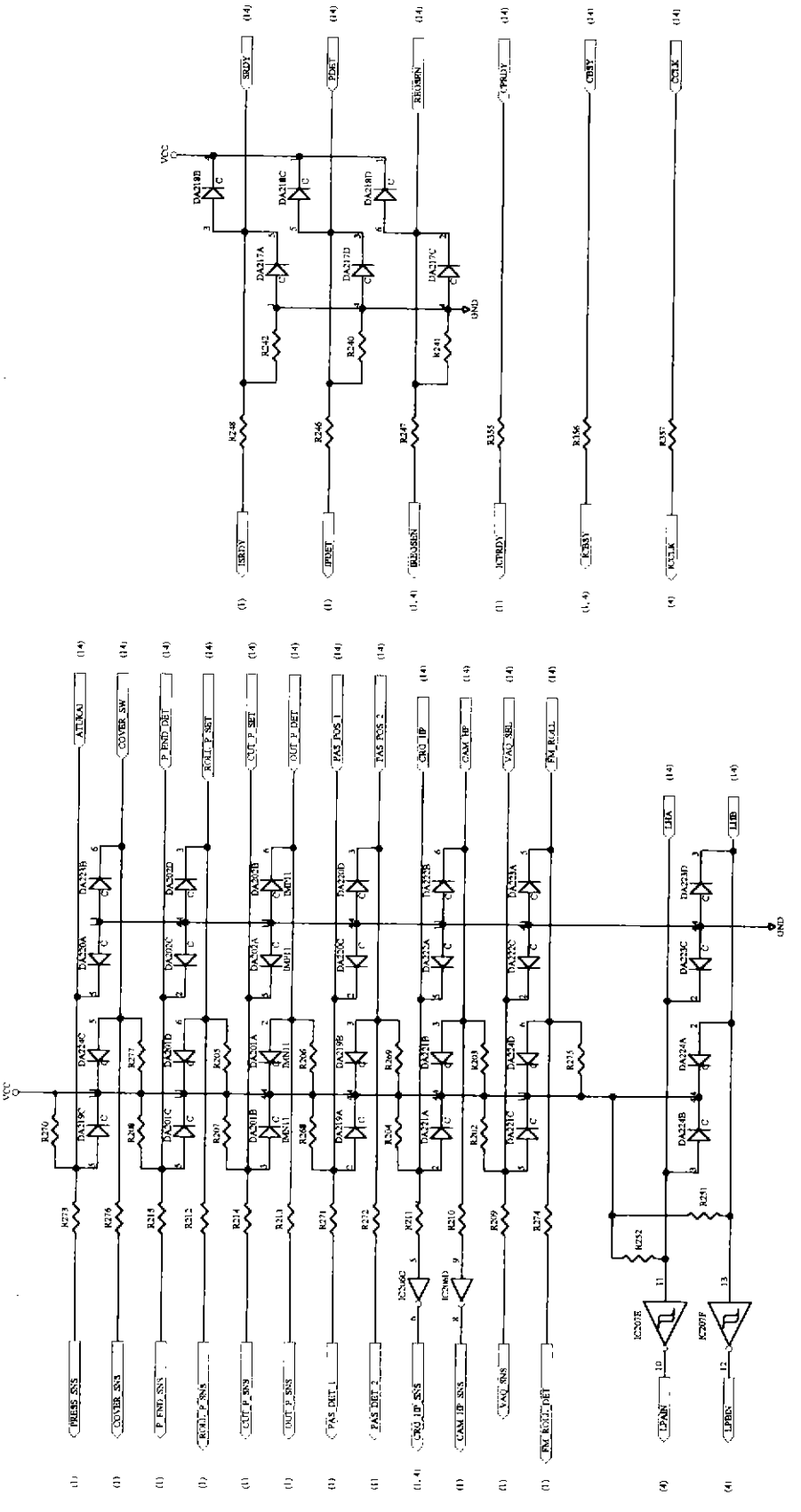
Engine Controller Board Circuit Diagram (13/14)



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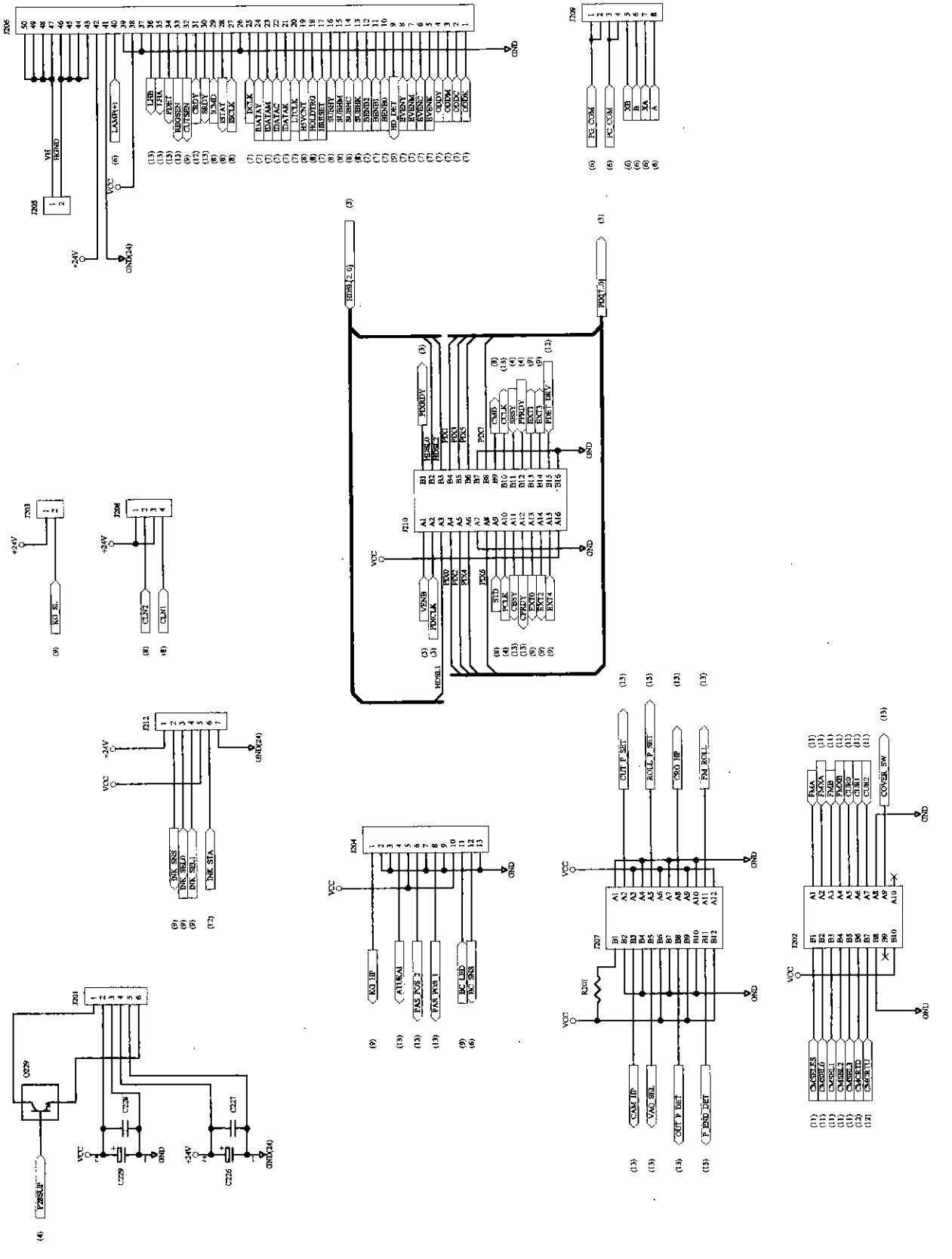
Engine Controller Board Circuit Diagram (14/14)



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D. IMAGE CONTROLLER BOARD CIRCUIT DIAGRAM

Image Controller Board Circuit Diagram (1/12)

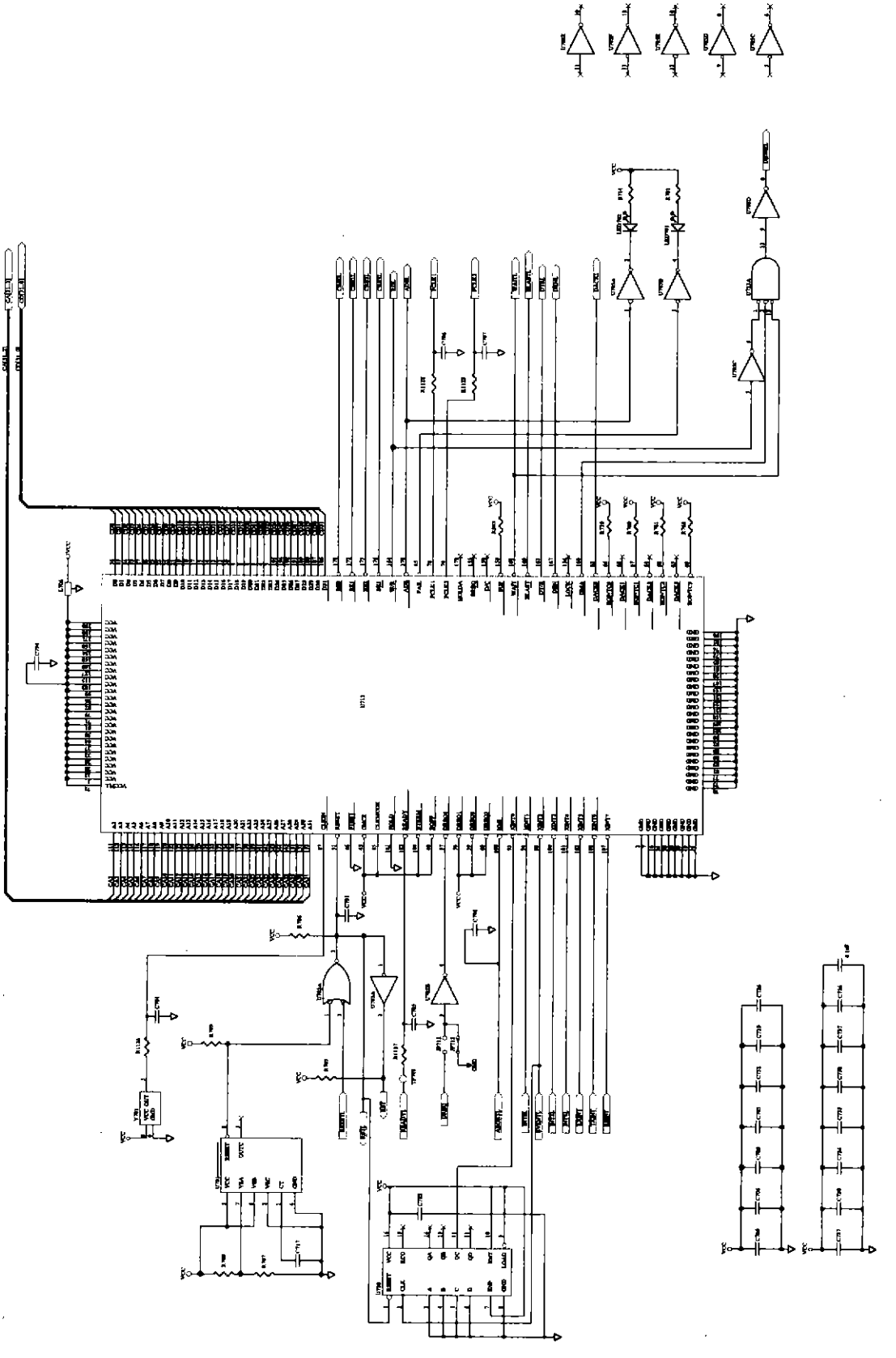

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Image Controller Board Circuit Diagram (2/12)

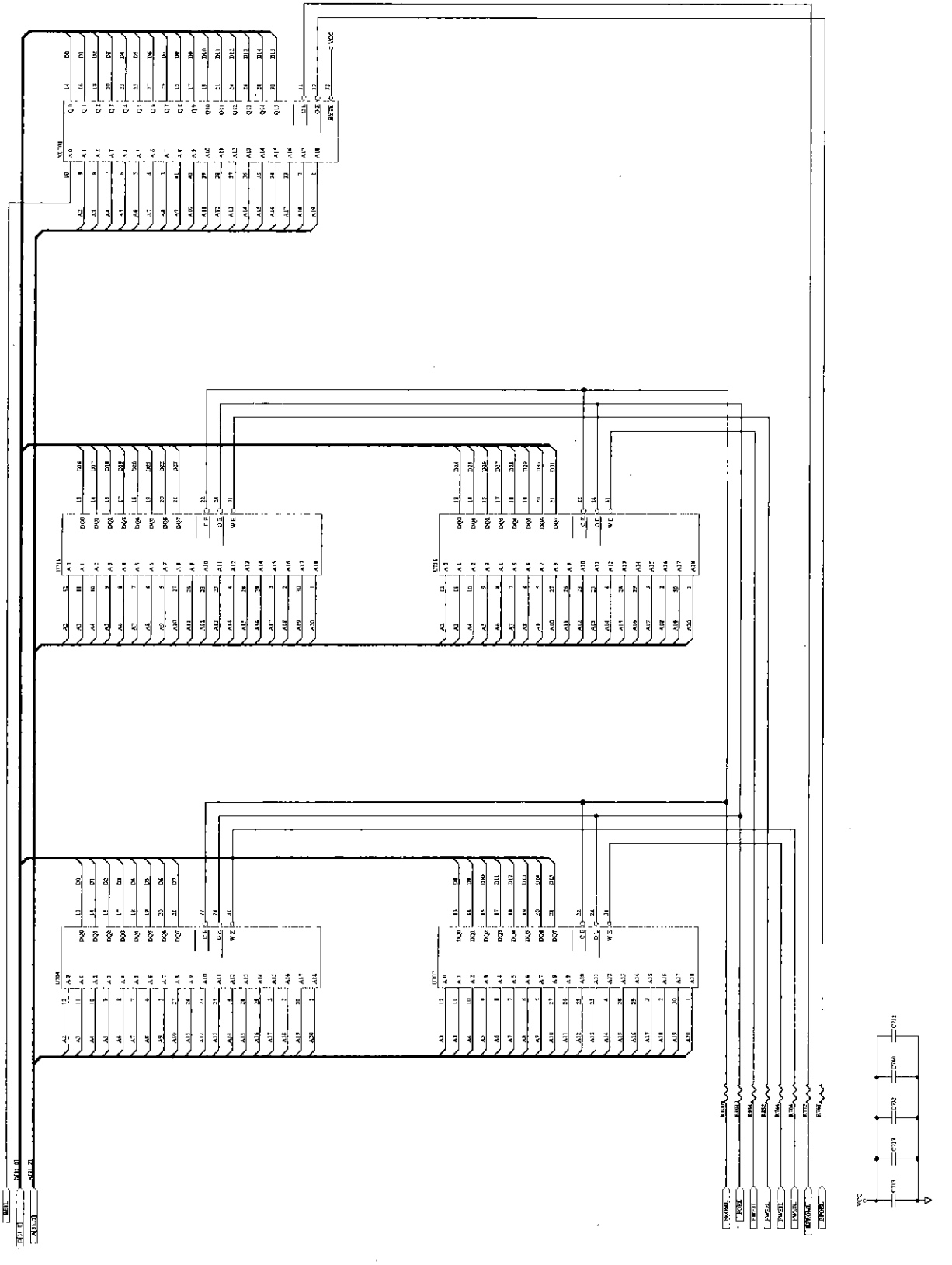

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Image Controller Board Circuit Diagram (3/12)

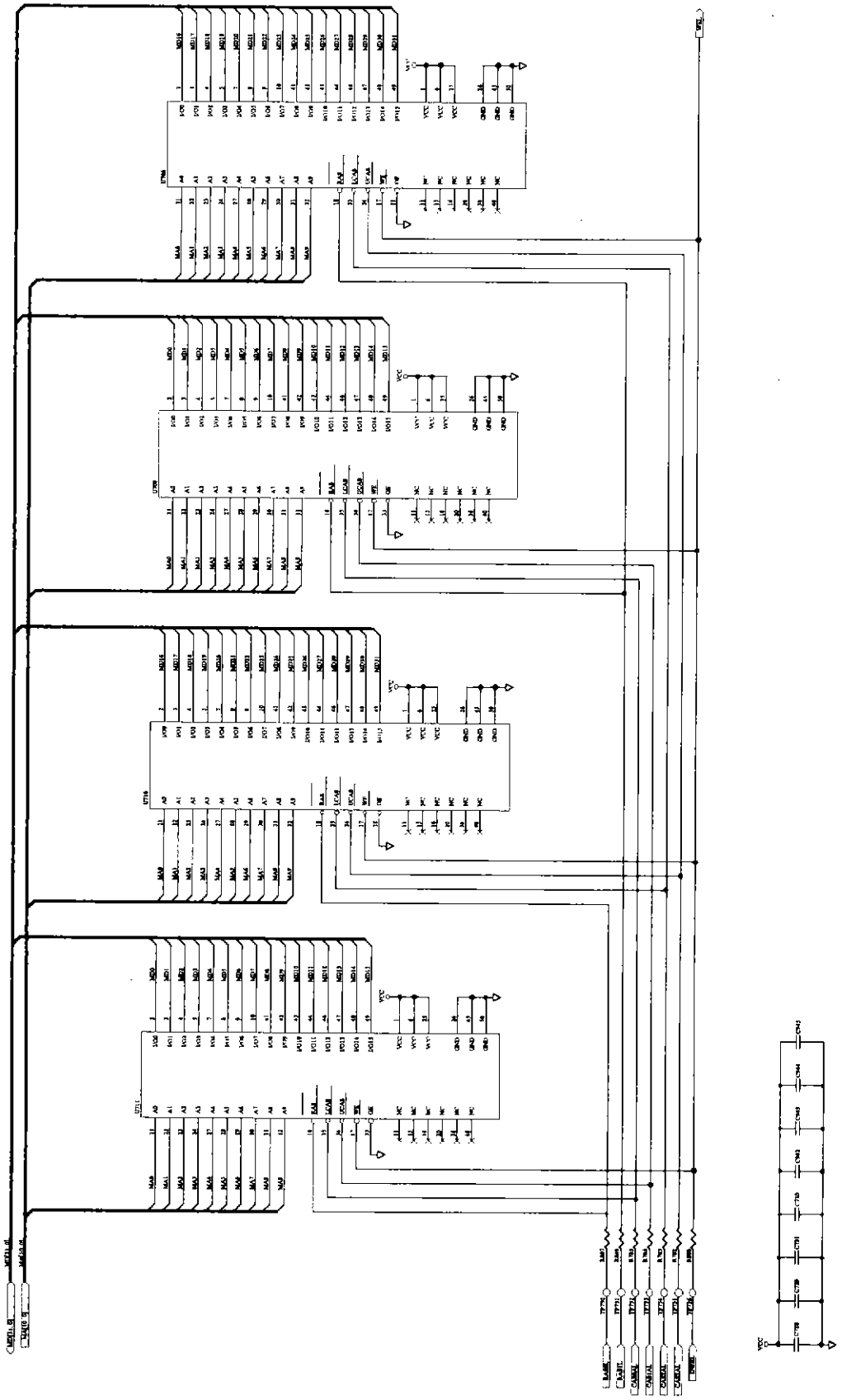

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Image Controller Board Circuit Diagram (4/12)

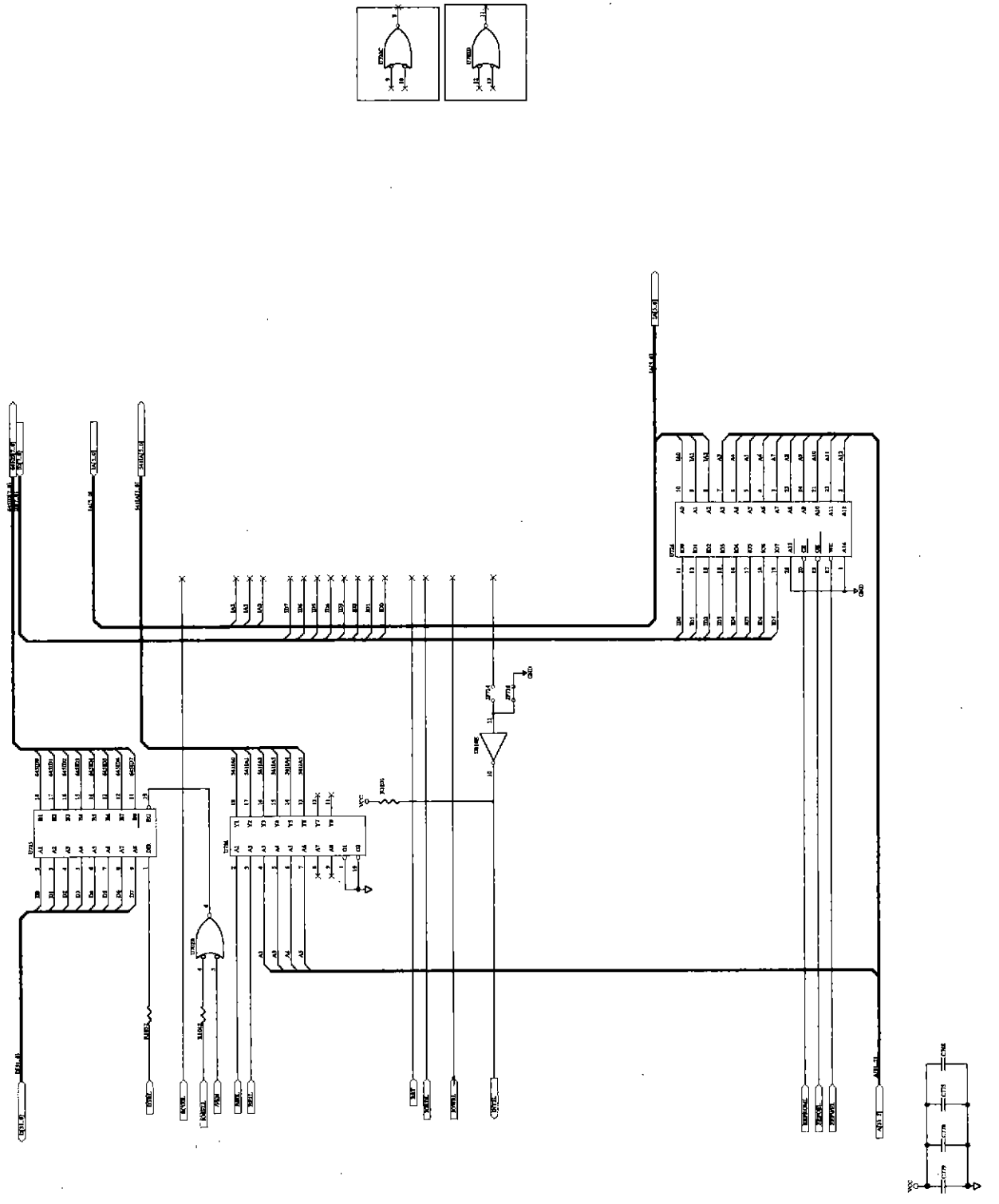

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Image Controller Board Circuit Diagram (5/12)

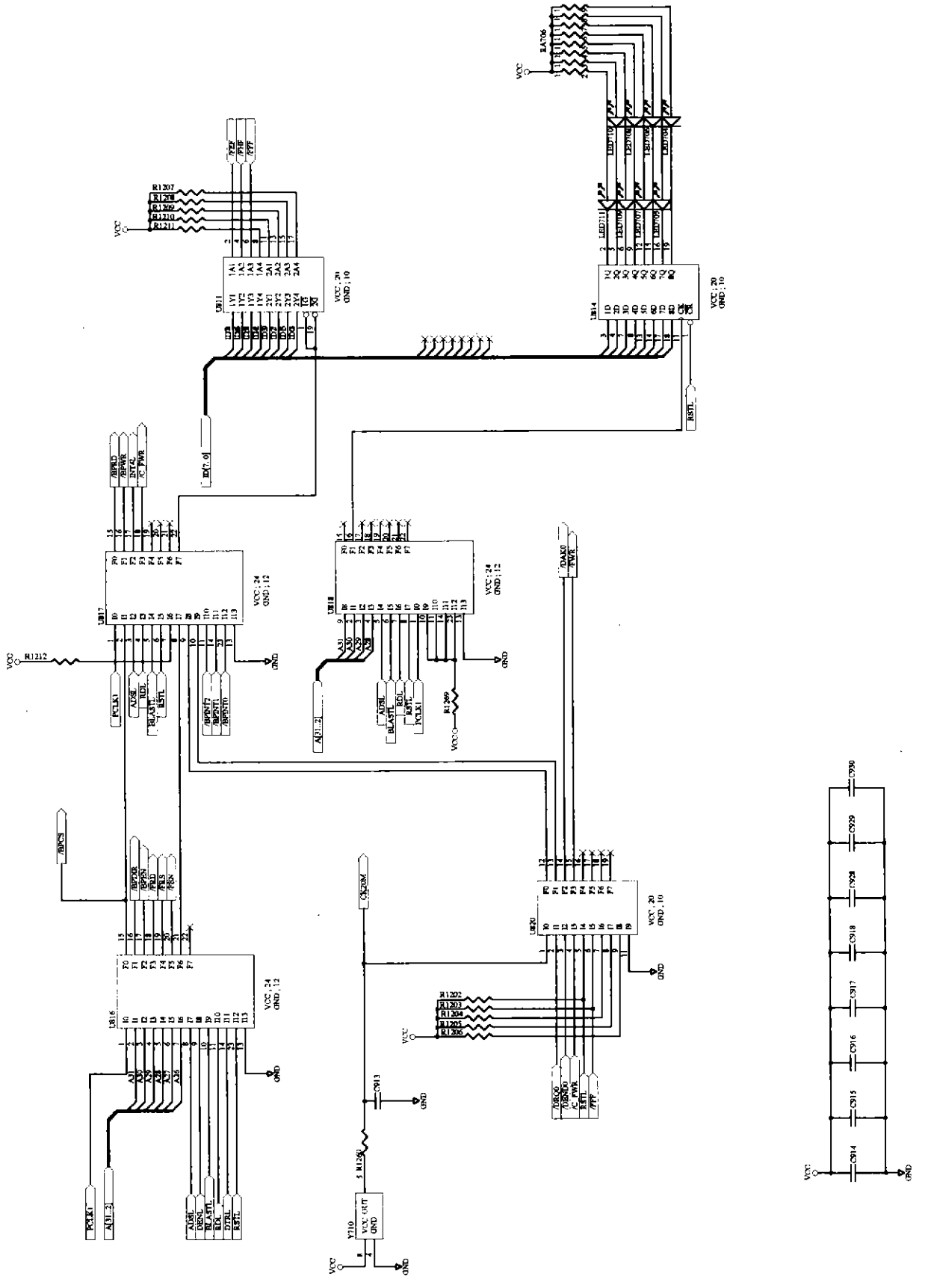

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Image Controller Board Circuit Diagram (6/12)

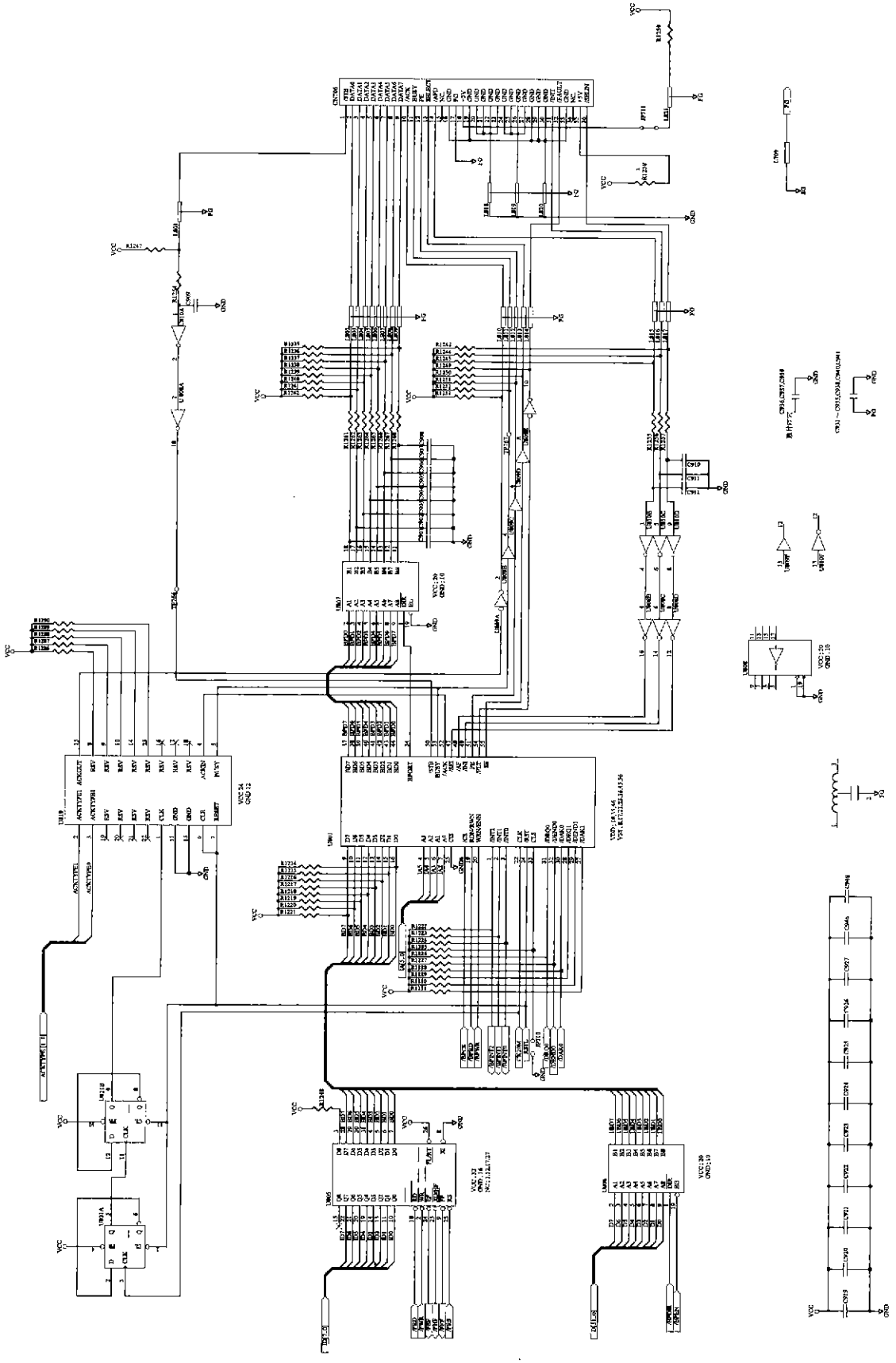

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Image Controller Board Circuit Diagram (7/12)

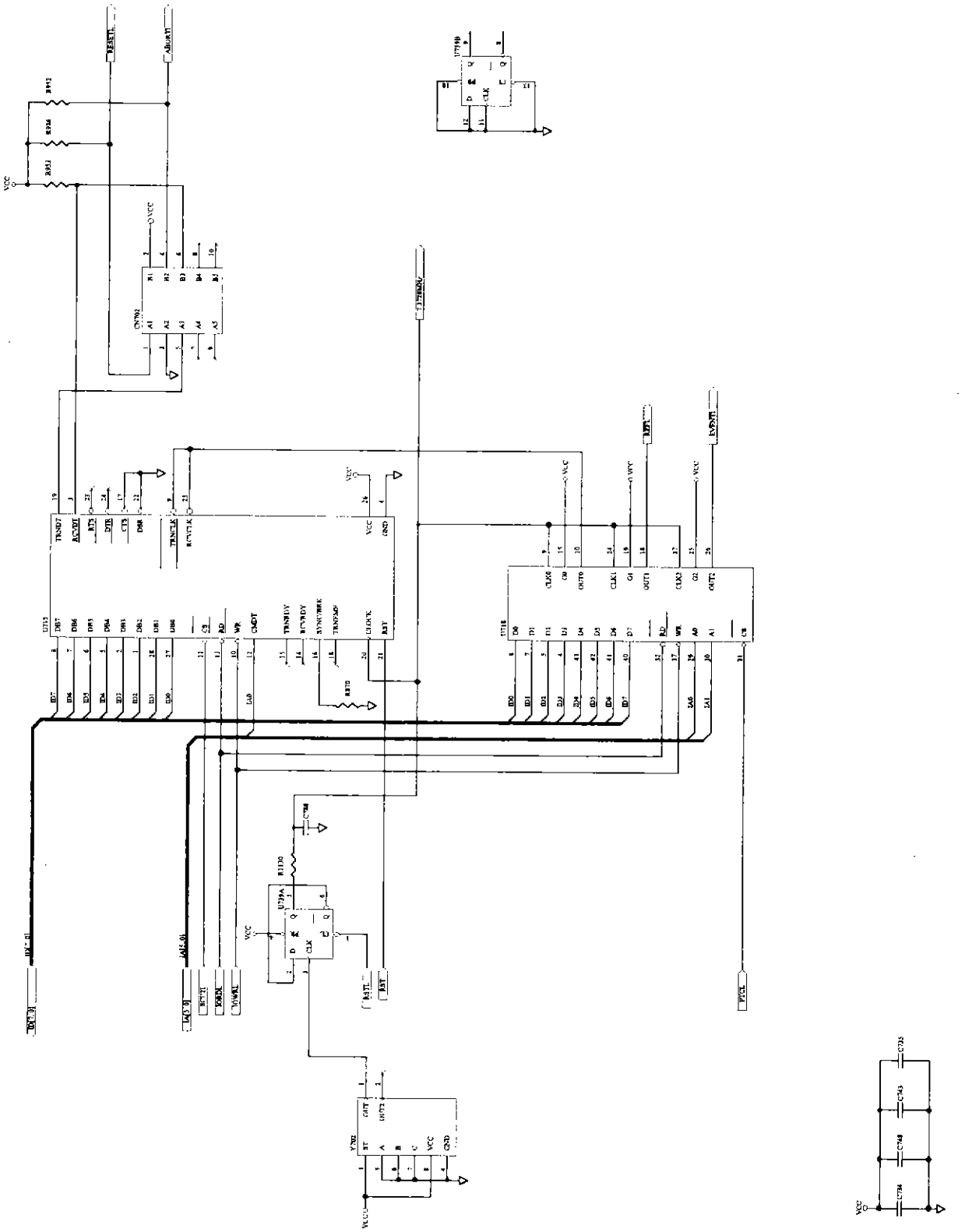

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Image Controller Board Circuit Diagram (8/12)

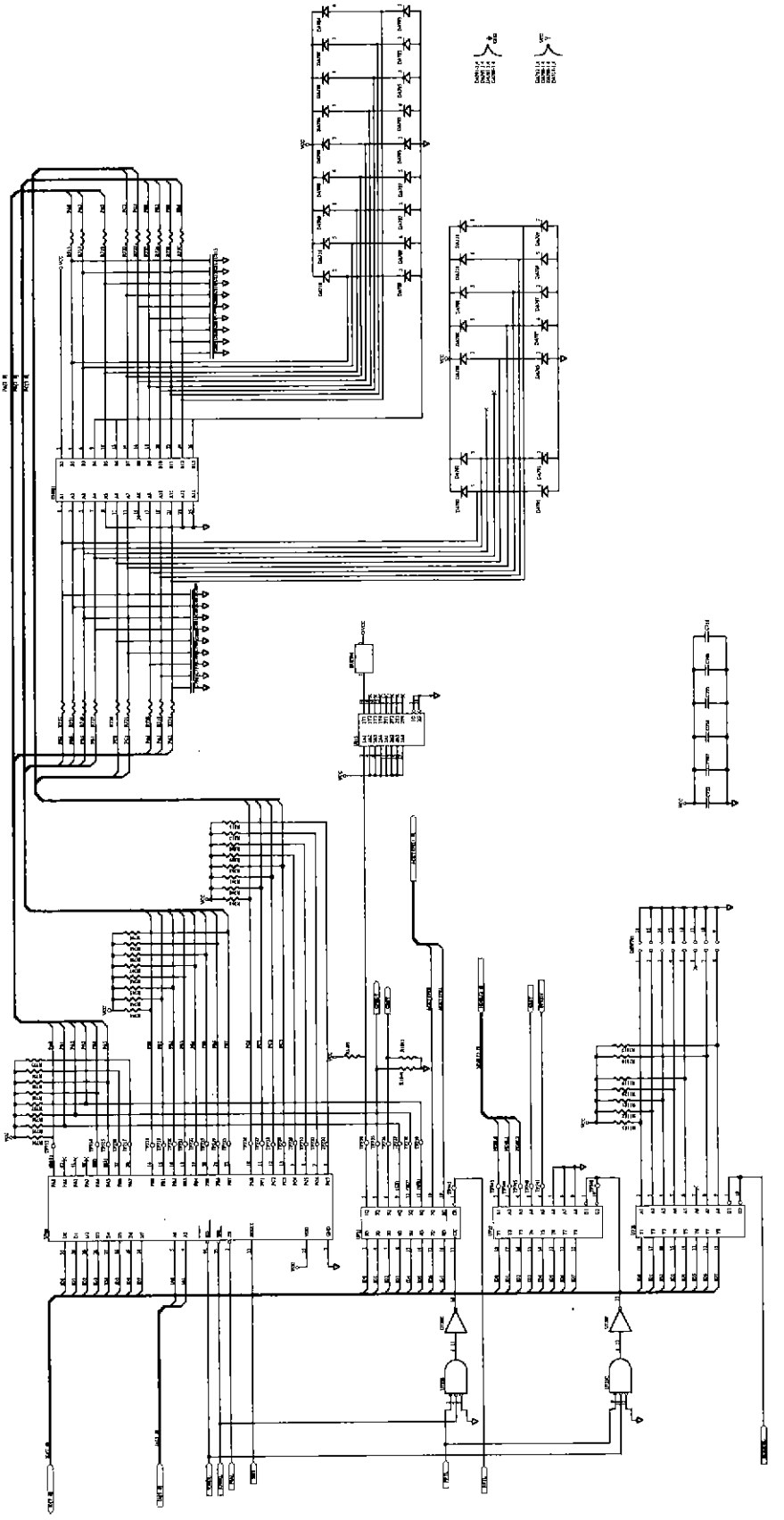

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Image Controller Board Circuit Diagram (9/12)

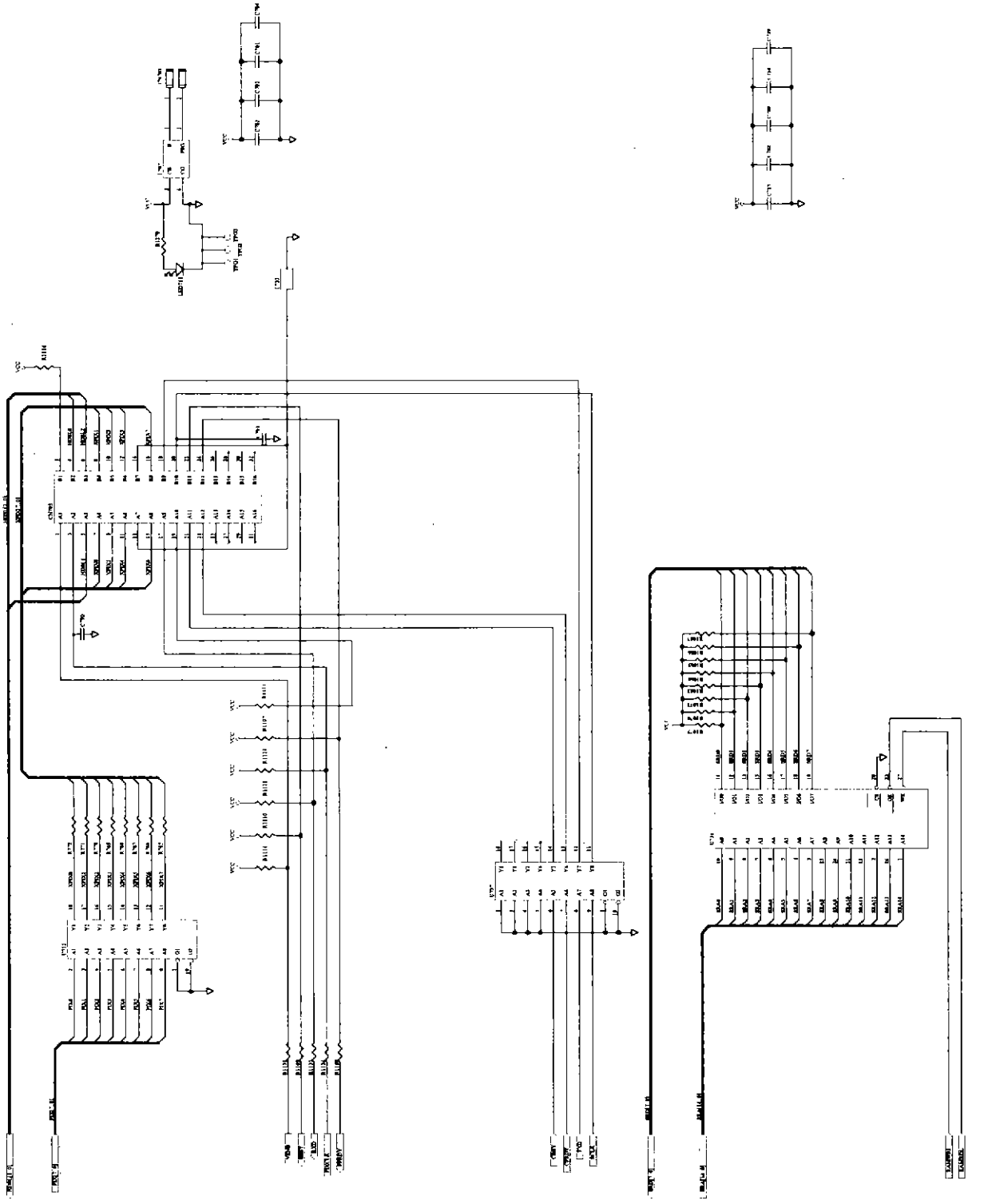

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Image Controller Board Circuit Diagram (10/12)

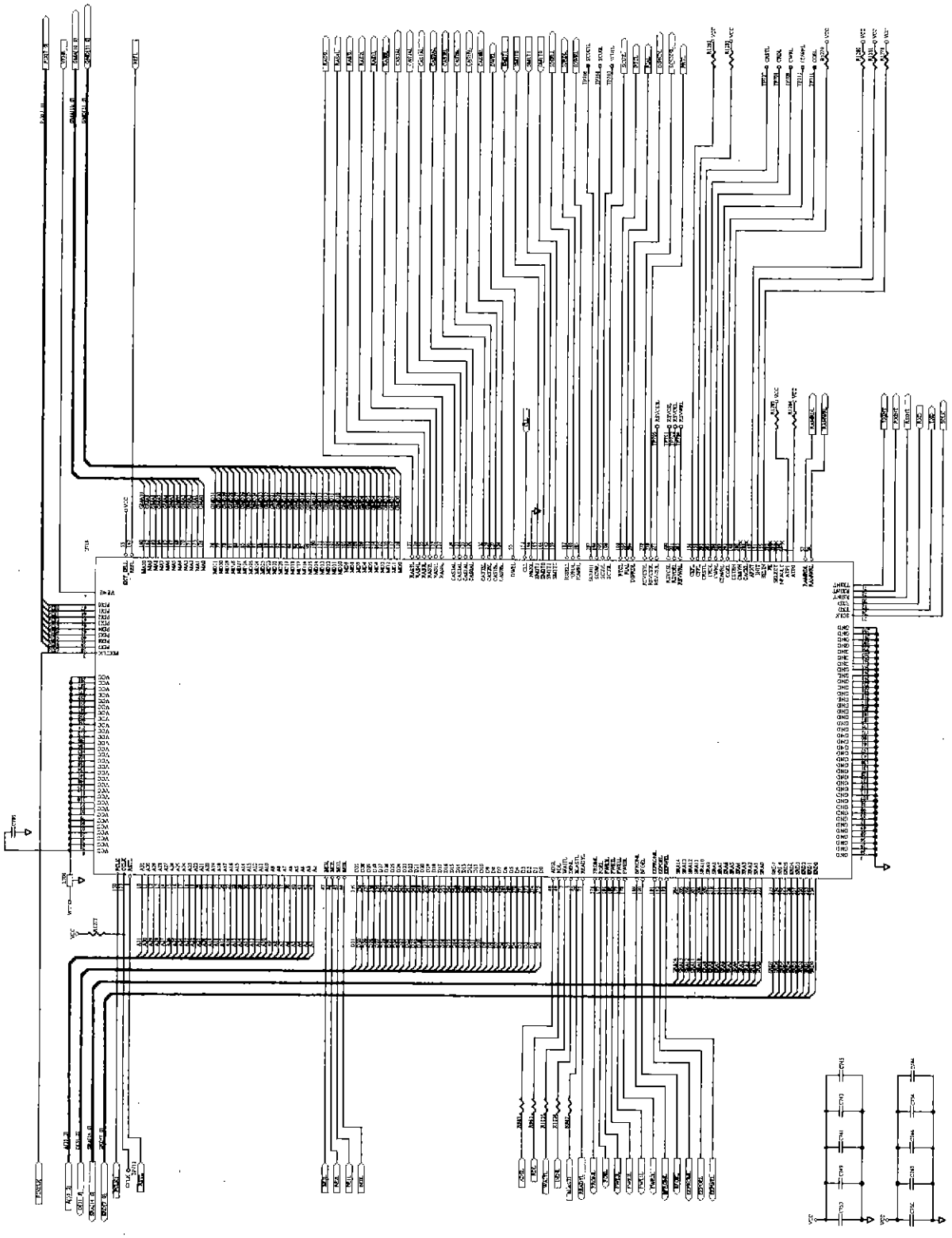

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Image Controller Board Circuit Diagram (11/12)

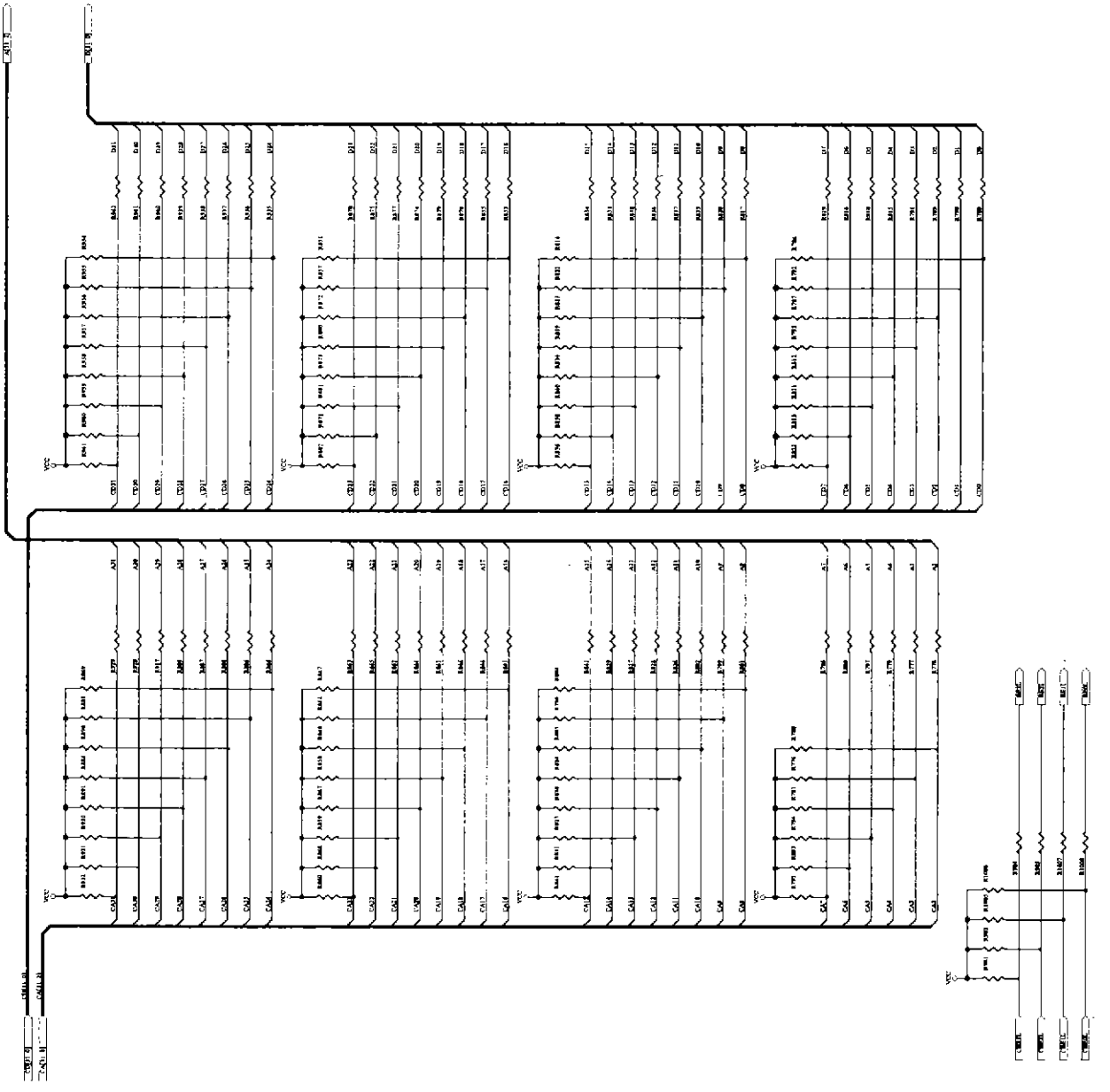

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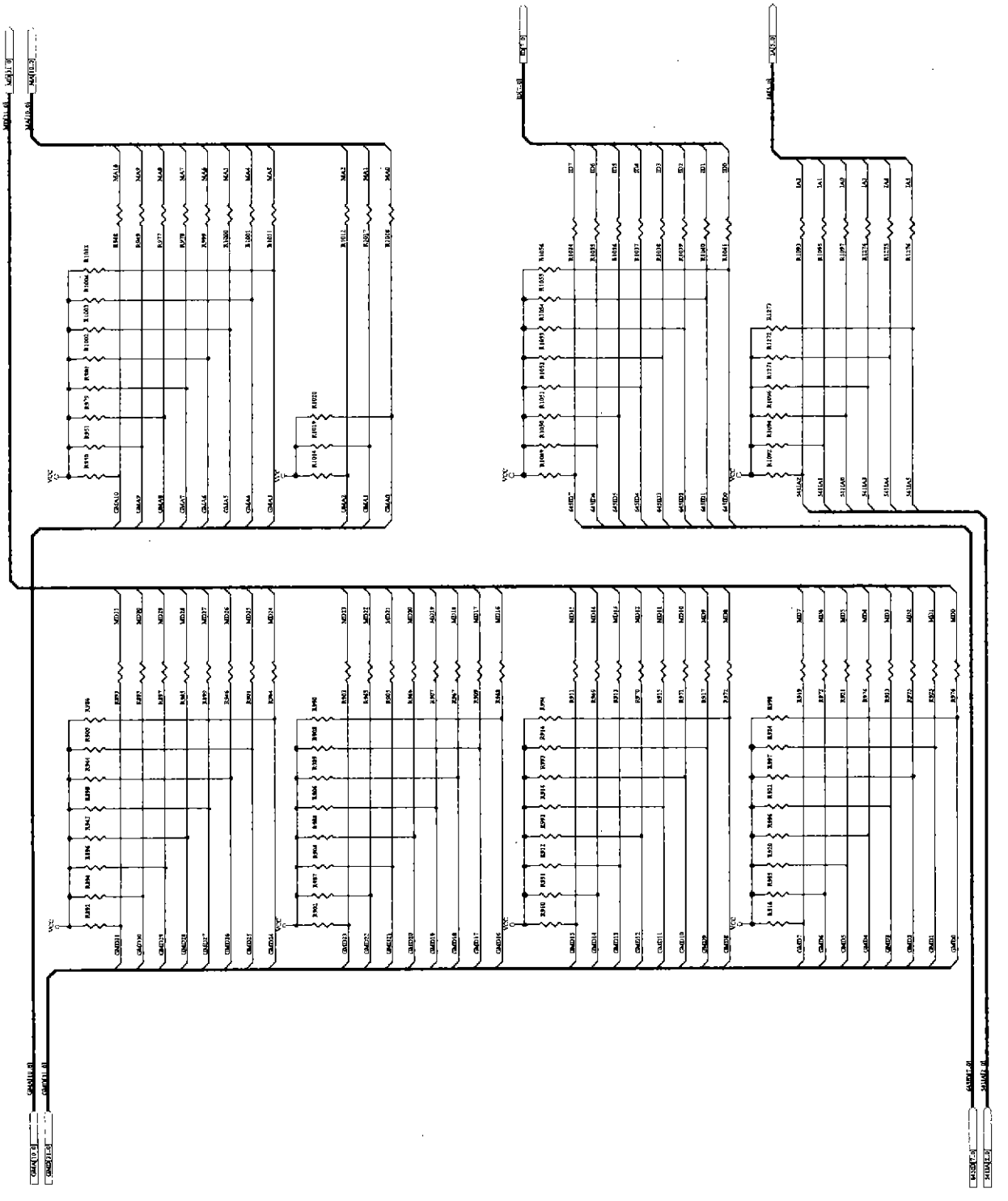
Image Controller Board Circuit Diagram (12/12)



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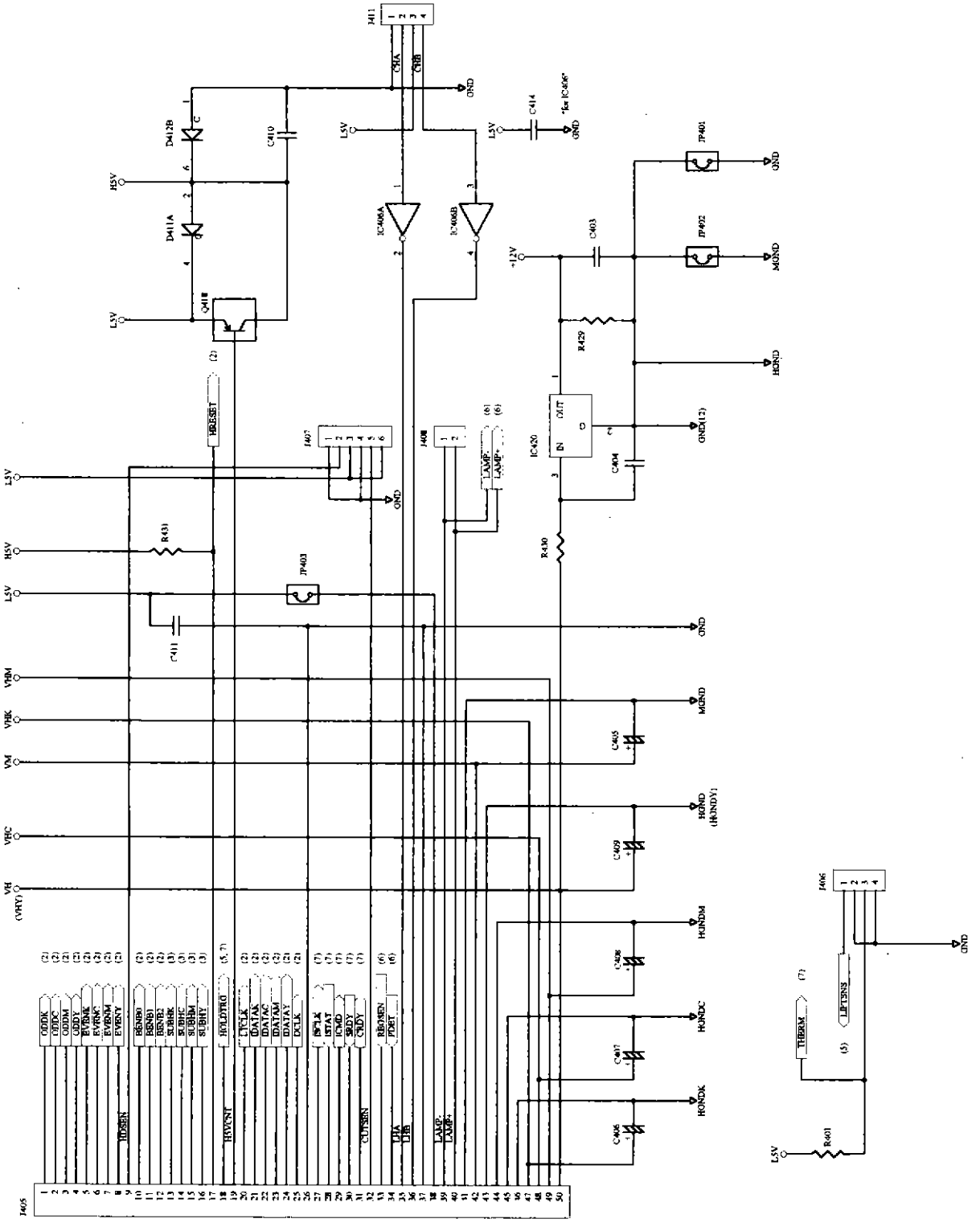
E. CARRIAGE BOARD CIRCUIT DIAGRAM

Carriage Board Circuit Diagram (1/7)



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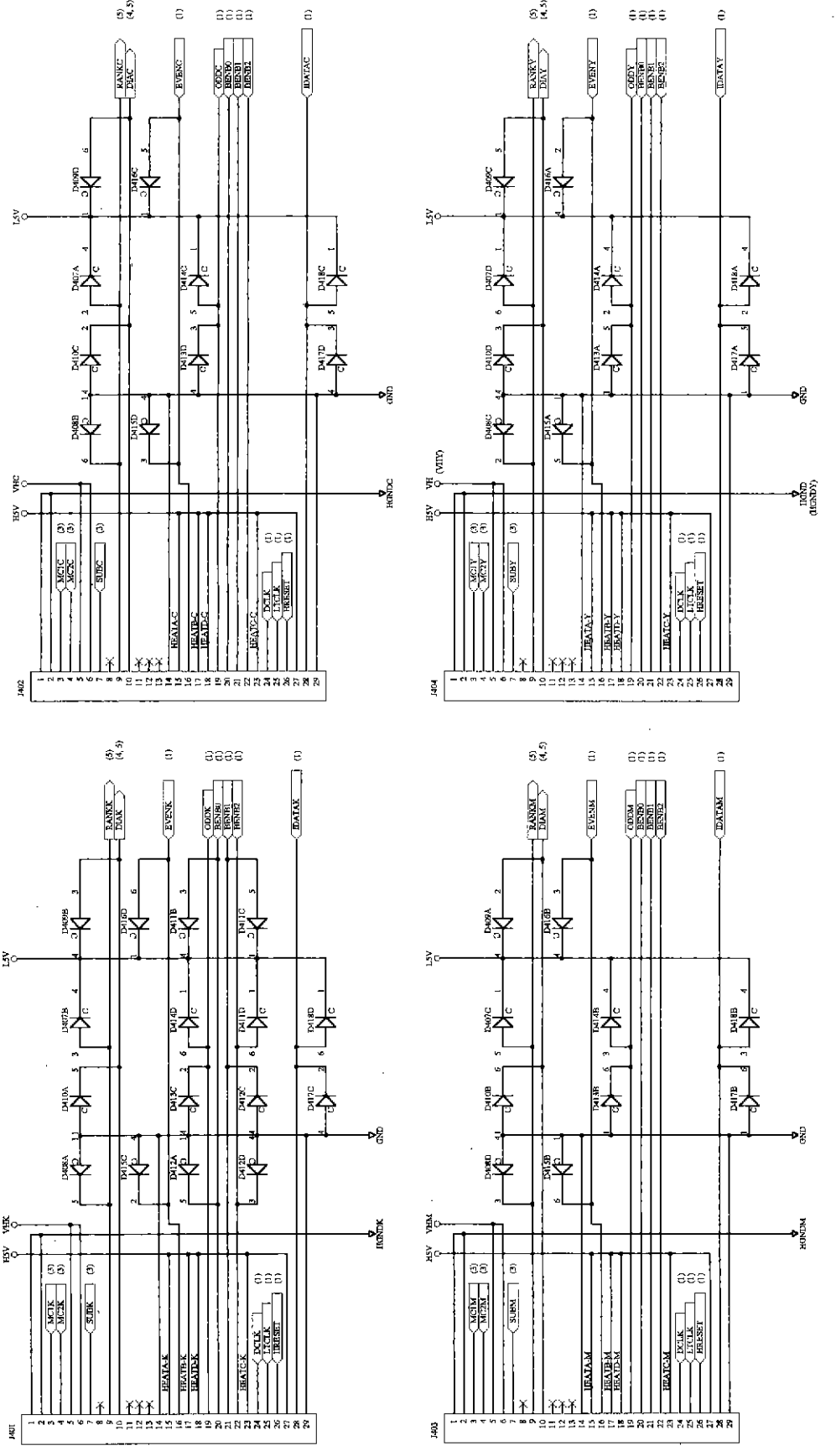
Carriage Board Circuit Diagram (2/7)



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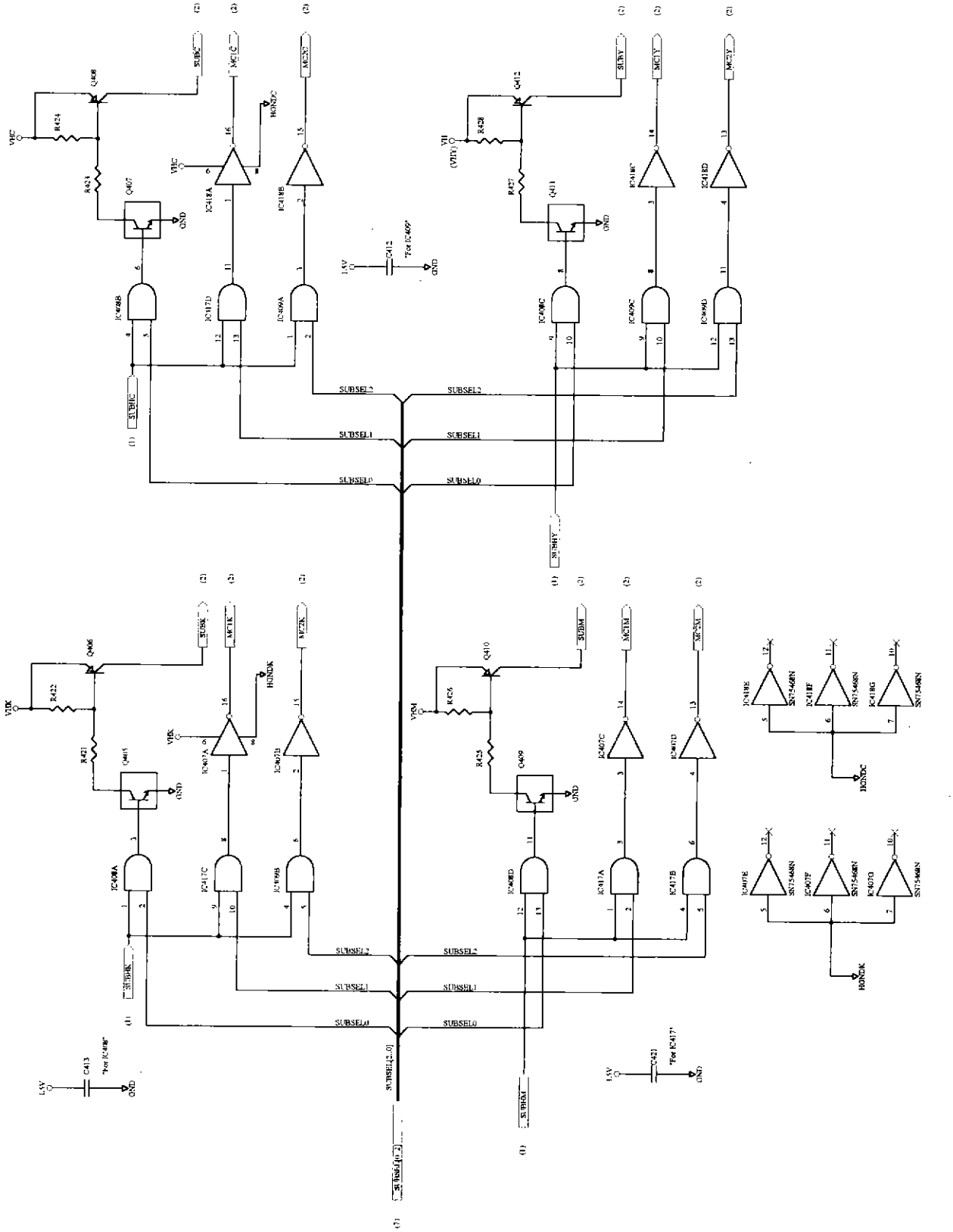
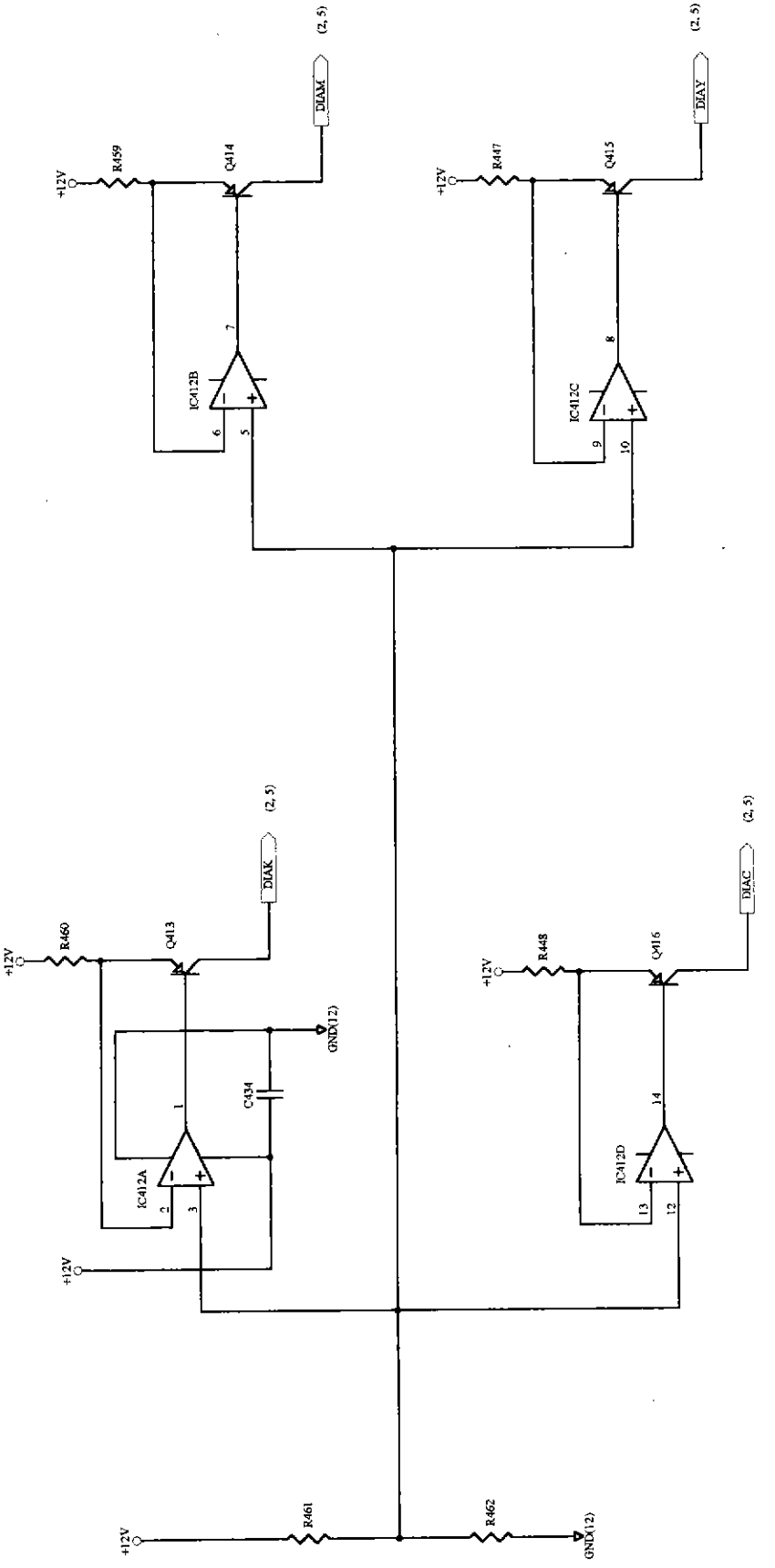
Carriage Board Circuit Diagram (3/7)


SUBSEL2
SUBSEL1
SUBSEL0
SUBSEL[2..0]
SUBSEL2
SUBSEL1
SUBSEL0
SUBSEL2
SUBSEL1
SUBSEL0
SUBSEL[2..0]
SUBSEL[2..0]
SUBSEL[2..0]

Carriage Board Circuit Diagram (4/7)



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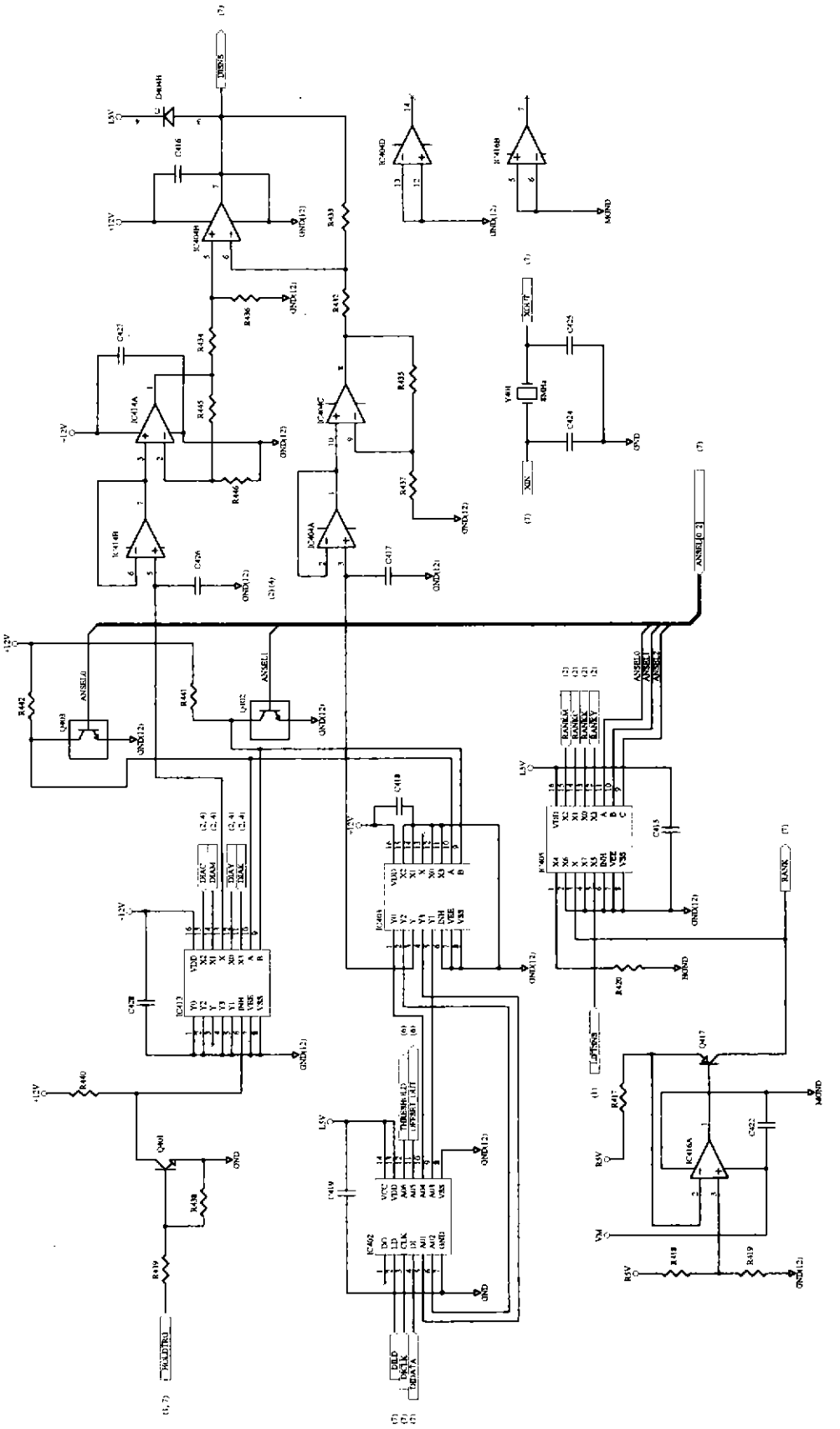
Carriage Board Circuit Diagram (5/7)



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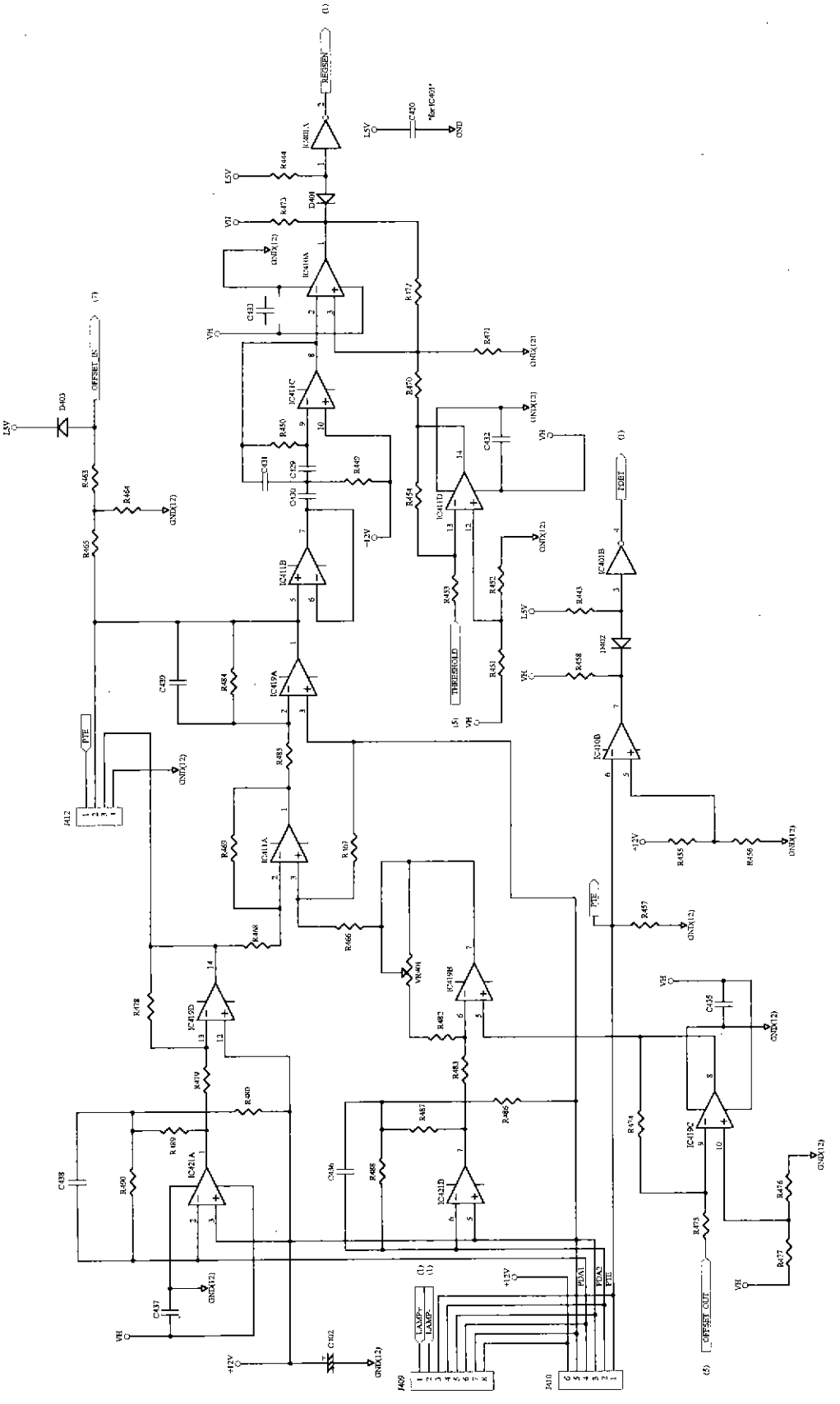
Carriage Board Circuit Diagram (6/7)



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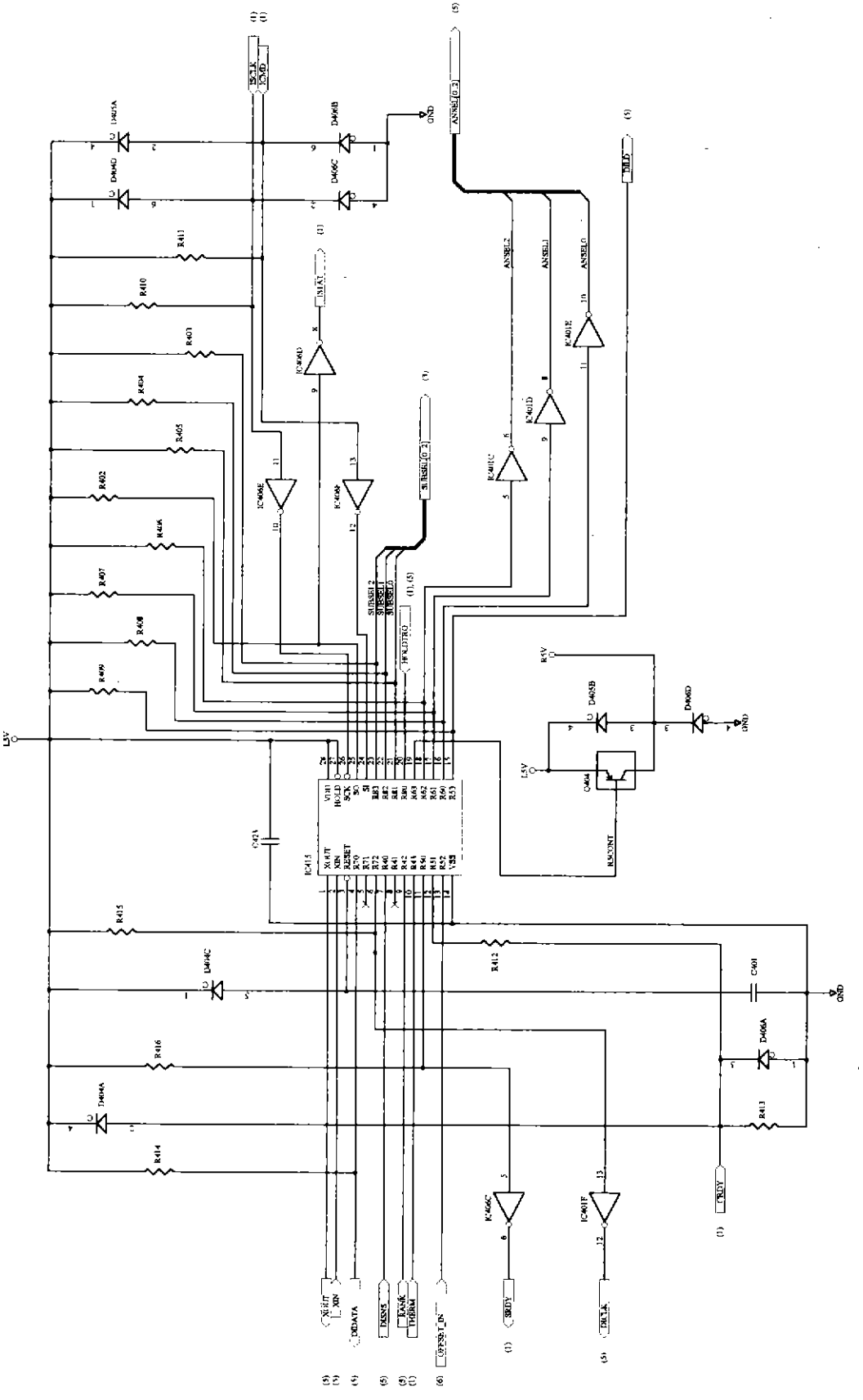
Carriage Board Circuit Diagram (7/7)



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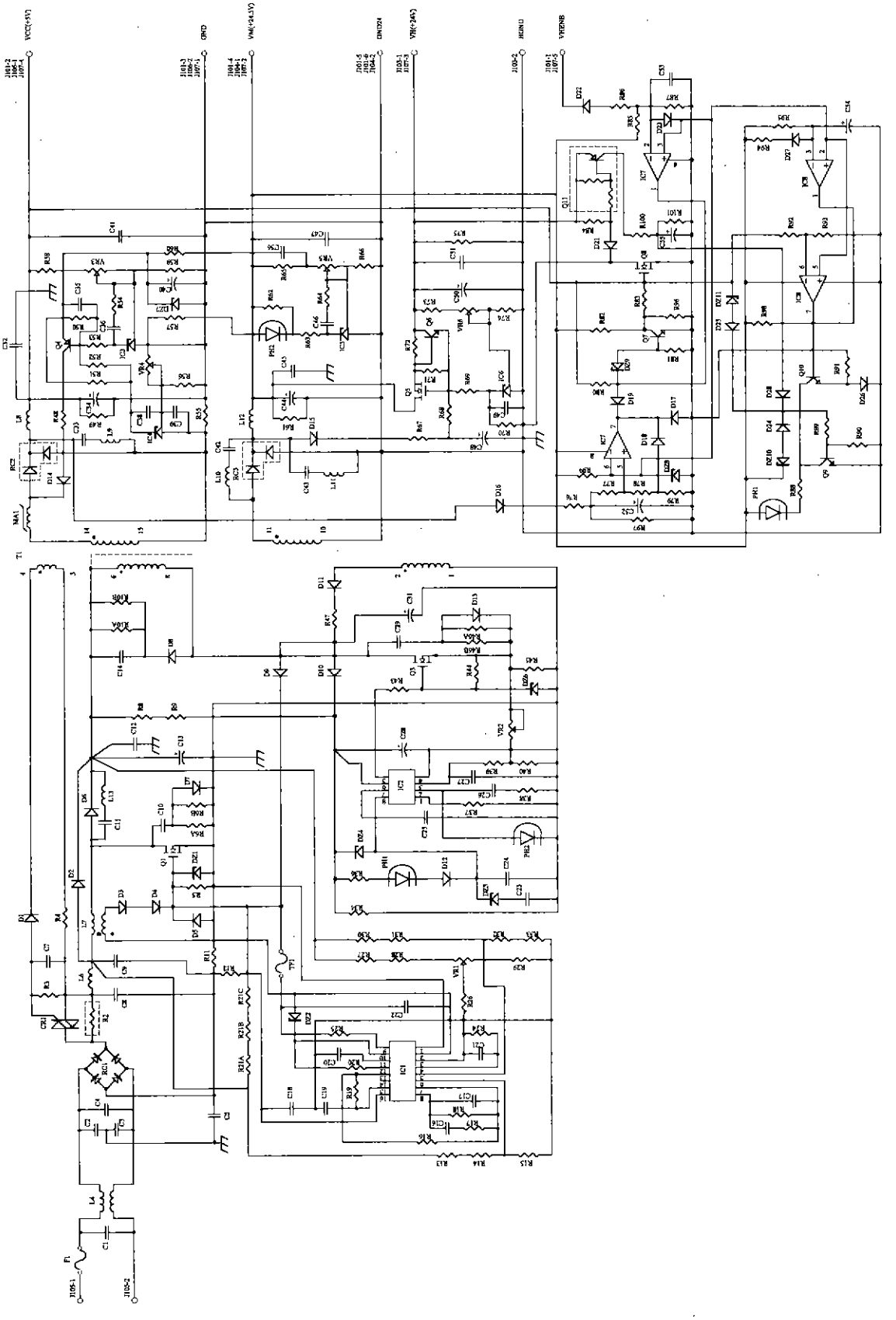
F. DC POWER BOARD CIRCUIT DIAGRAM



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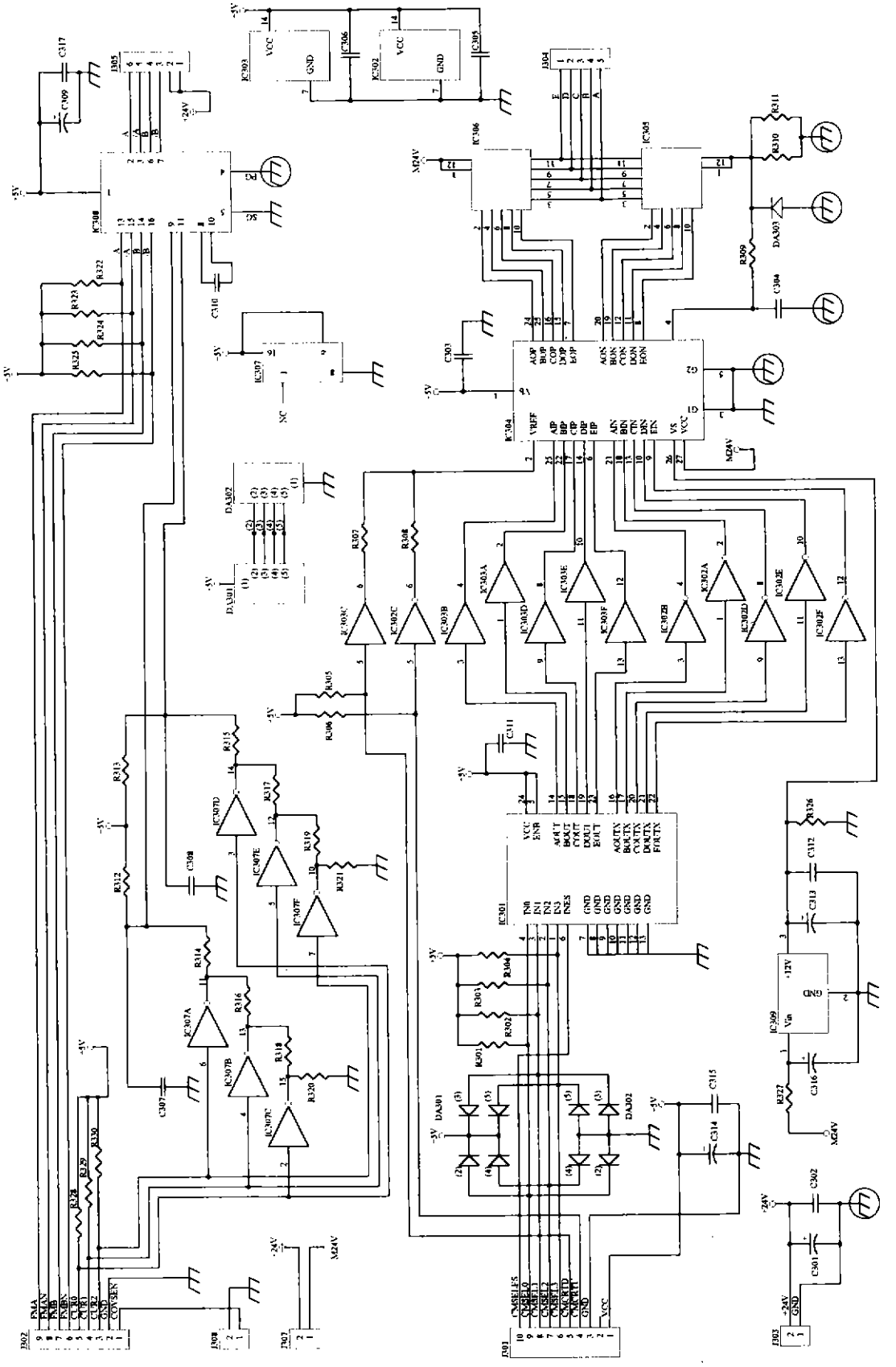
G. MOTOR CONTROLLER BOARD CIRCUIT DIAGRAM



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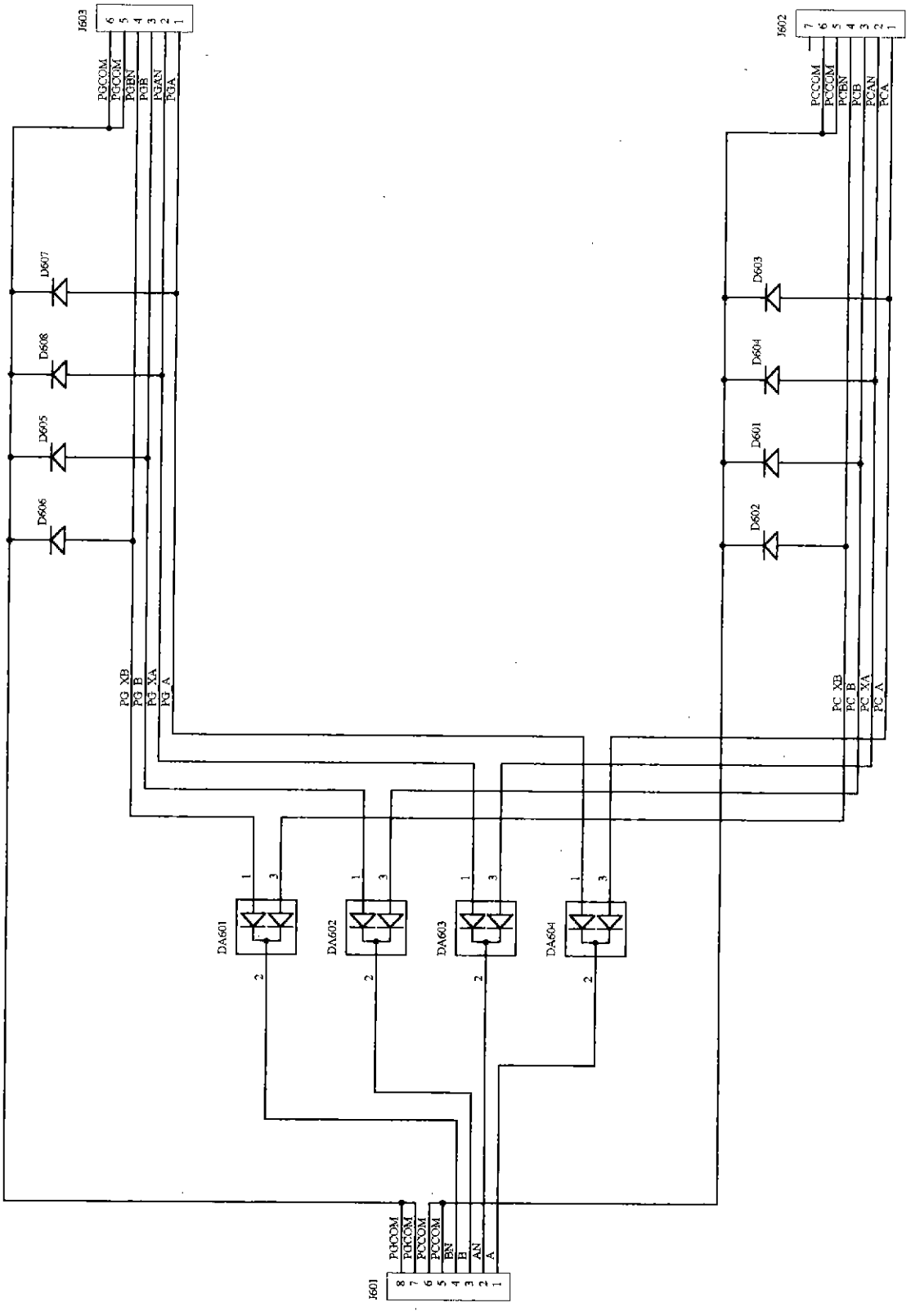
H. INK DETECTION BOARD CIRCUIT DIAGRAM

Ink Detection Board Circuit Diagram (1/3)



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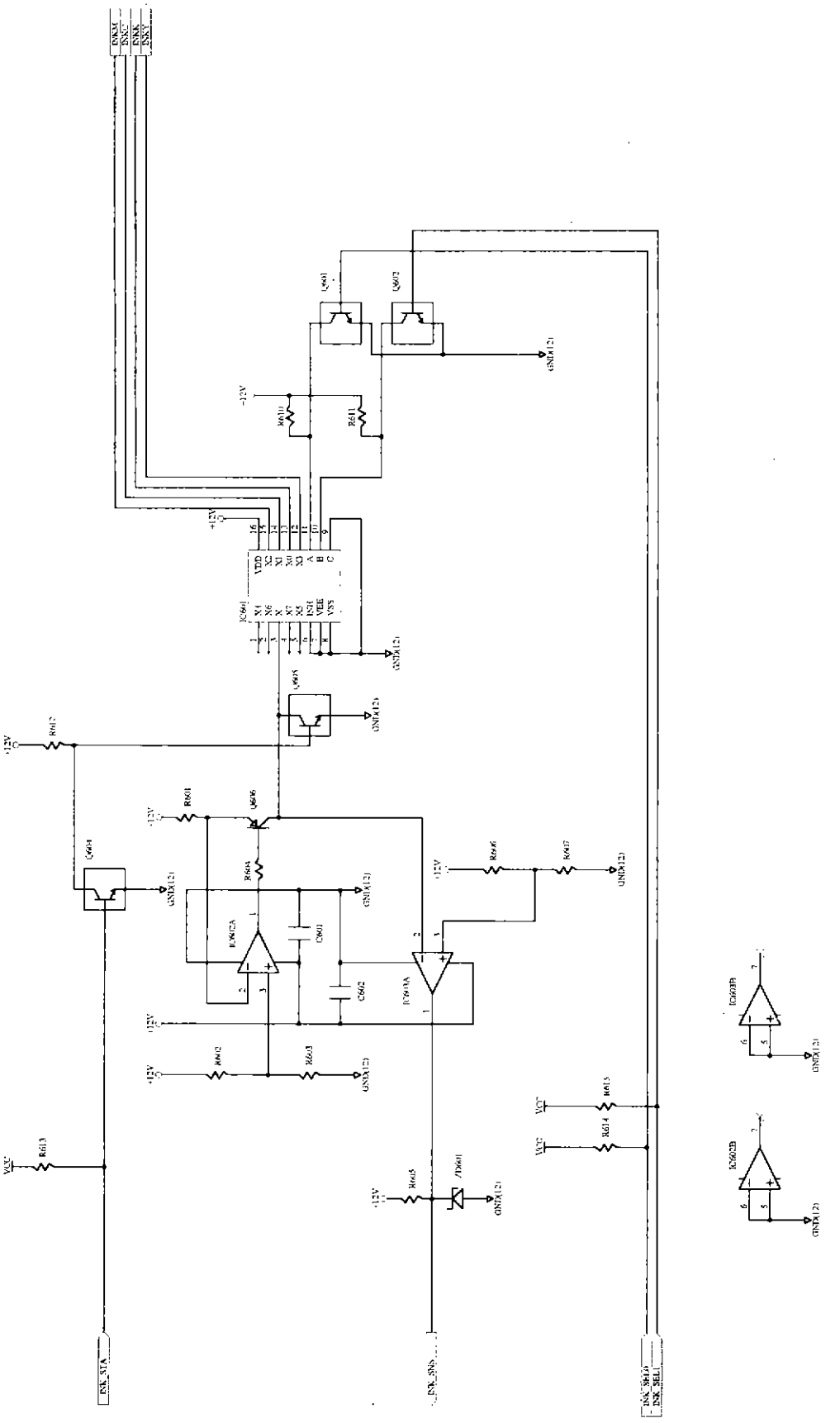
Ink Detection Board Circuit Diagram (2/3)



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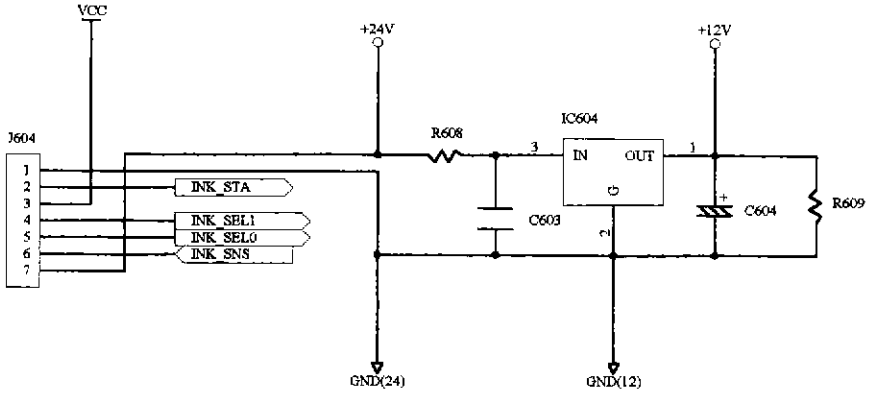
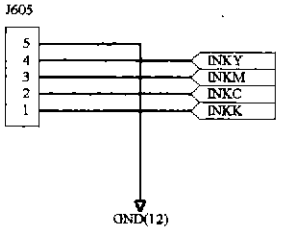
Ink Detection Board Circuit Diagram (3/3)





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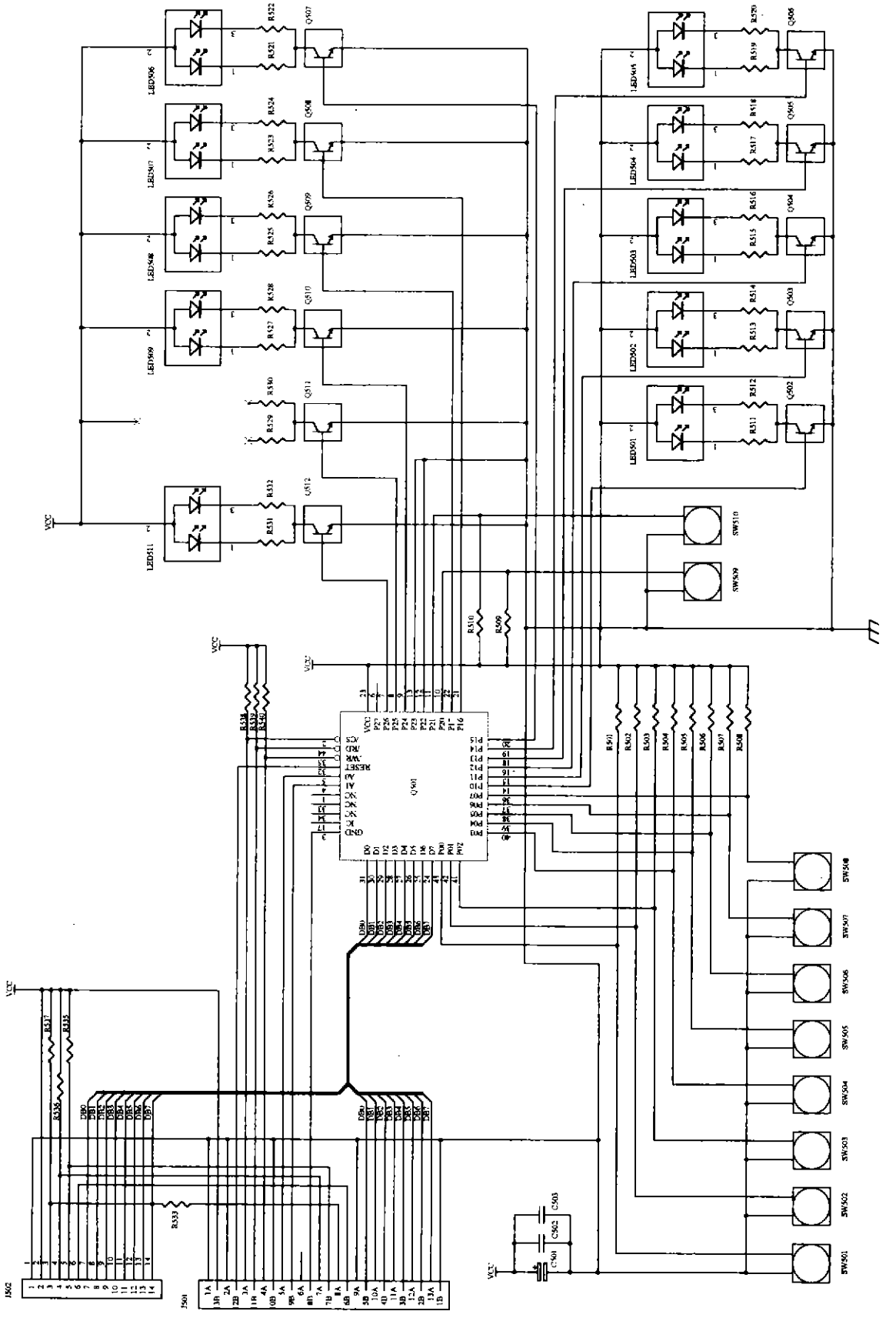
I. OPERATION PANEL BOARD CIRCUIT DIAGRAM



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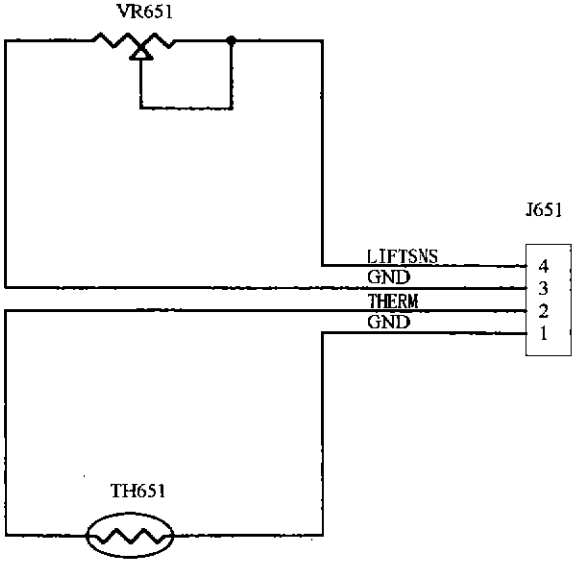
J. VOLUME BOARD CIRCUIT DIAGRAM



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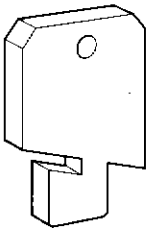
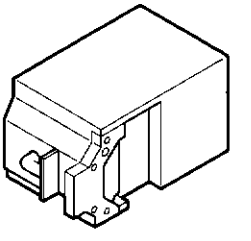
K. SPECIAL TOOLS

No.	Tool	Tool No.	Configuration	Rank	Remarks
1	Cover switch tool	6Y8-2123		A	
2	Head temperature sensor tool	6Y8-2125		B	Use it when adjusting head temperature sensor

Note:
Rank
A: Each service man is expected to carry one.
B: A group of five service men is expected to carry one.
C: Each work shop is expected to carry one.

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